Automation system migration

By G Wilson, Siemens Industry Automation

Migration tools assist in the migration of old software projects into new software projects that can be downloaded into the new hardware.

If you are a factory or process plant technician or electrical engineer, you will know that one of the challenges that faces plant operation is equipment ageing and the incorporation of new technology into an old plant.

As equipment ages the possibility of product failure also increases. Some of the installed equipment could be 10 to 20 years old. Devices like programmable logic controllers (PLCs), human machine interface (HMI) panels, industrial computers, variable speed drives (VSDs), process instruments and intelligent switchgear, are more susceptible to electronic failures due to ageing. One way of making sure such equipment failures do not cause plant stoppages is by replacing these old products. Some of these old products may be available, but at a much higher price, some may be phased out or fully discontinued.

The availability of old parts presents another challenge, as a customer might be forced to upgrade to a new version product that uses newer programming software or even to a completely new product that has many differences from the old product. Aspects like old to new product cabinet mounting size differences seem trivial, but pose a real problem on site. If the programming or visualization software is also required to be part of the plant, then issues like the Windows operating system changes are also to be considered, as some computers might still be running on MS DOS, Windows NT or Windows 2000, which are old. Currently Windows XP or Windows 7 seem to be the norm; Windows 8 is now available; 64 bit computer motherboard processors are also readily available and currently in use.

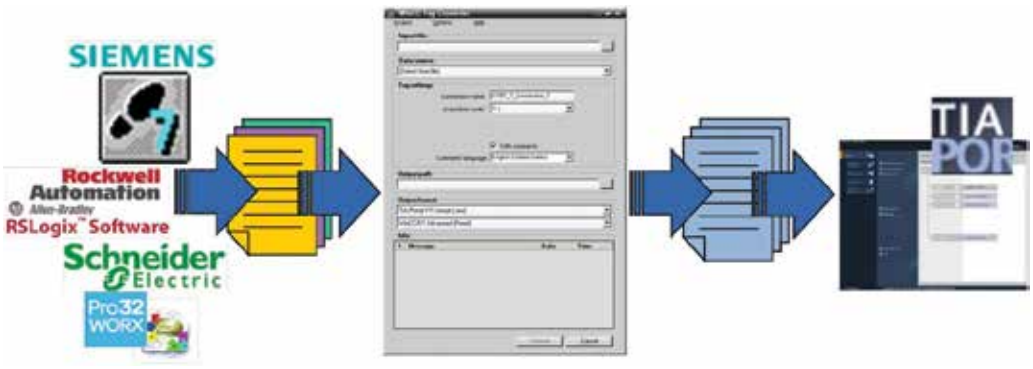
From a software engineering point of view the biggest challenge when moving from an old product to a new product is software code reusability. For example if you have an old PLC installed that is programmed in LADDER, Function Block Diagram or Statement List, if you have to move to a newer product it would be time consuming and costly to completely rewrite this programming code from the beginning.

An engineer would have to print out the old program, analyse it, understand how the program should work and then rewrite and download the software code for the new product. Another old to new product change example would be HMI panels. Some installed old HMIs have many visualization screens and to re-engineer these screens from scratch without knowledge of how the HMI tag variables, buttons and input/output fields operate together with the PLC controller could also be challenging, time consuming and costly.

Changing from an old installed product that is produced by Company X to a new product that is designed by a completely different Company Y is even more challenging, as the software programming layout and features might be completely different ie maybe the new supplier does not support Statement List programming or does not support Profibus. End customers should always keep back-up software programs readily available in some type of secure software library, as these will become useful when a migration needs to take place ie some of the online projects kept within installed running products do not have program comments shown, which poses a problem because people constantly change jobs and a new person working on site will have little knowledge of how the online program works.

Migration tools are a key aspect to consider, as they help customers migrate old software projects into new software projects that can be downloaded into the new hardware. Below are some example migration tools that are available from Siemens Industry Automation:

- S5 PLC <to> S7 PLC Program Blocks Migration Tool
- S7-200 <to> S7-1200 Program Blocks Migration Tool
- HMI ProTool Software <to> HMI WinCC Flexible Software
- HMI WinCC Flexible Software <to> TIA Portal WinCC
- WinCC SCADA old version <to> WinCC SCADA new version
- PCS7 DCS old version <to> PCS7 DCS new version



DCS – Distributed Control System
HMI – Human Machine Interface
MS DOS – Micro s oft Disk Operating System
PLC – Programmable Logic Controller
SCADA – Supervisory Control And Data Acquisition
TIA – Totally Integrated Automation
VSD – Variable Speed Drive

Abbreviations

- STEP7 V5, ProWORX, Concept, Unity Pro XL, RSLogix5/500/5000 software program symbols <to> TIA Portal software program tags/ symbols

Other software migration tools are available for customers who plan to build new plants and for plants that exist - these are all important factors to consider. The short term aspect might be a quick cheap solution, however the long term migration and support aspects should also be considered. Technology is always changing and with it comes improvements such as ease of use, more diagnostics, easier installation and improved design; therefore migration to newer technology is not bad thing – it is a good thing. One such example would be the migration from the older type PLC controllers which were programmed via RS232/485 to new PLC controllers that have onboard Ethernet ie the Siemens S7-1200/1500 PLCs.

New standard laptops do not come with RS232/485 ports and therefore an adapter would be required, but Ethernet comes standard on all new laptops. Another example would be if a customer decides to change their installed Windows operating system version throughout their plant. This poses a problem as the older type installed software does not support this new Windows version, therefore purchasing an upgrade software package to the latest software version that does work on the newer Windows version is cheaper than buying a complete new software package.

Conclusion

From this discussion, it can be seen that migration aspects do play a role when selecting products that will be installed for a particular application.

After completing his national diploma at Nelson Mandela Metropolitan University (NMMU) in 2001, Gary Wilson joined Siemens Industry Automation during which time he has gained much automation product knowledge and site experience. He is currently product promoter for PLC and HMI products. He obtained a BTech Electrical Engineering degree through UNISA and is registered as a Professional Engineering Technologist with the Engineering Council of South Africa (ECSA). Enquiries: Tel: 011 652 2000 or email gary_wilson@siemens.com.

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