Prolong Machine Life-Cycles with zenon

www.copadata.com
sales@copadata.com

zenon
do it your way

Content

1. Introduction

In the Food and Beverage Industry, machinery is often expected to have a long lifetime. This can lead to very heterogeneous production environments running machines from different generations. In addition, the older the machinery gets, the more difficult its maintenance becomes.

In this White Paper we explore how the software system zenon can prolong the lifecycle of machines in production plants – and make maintenance easier and less costly.

2. Situation: HMI today

The two main elements of automation in a machine are the PLC (Programmable Logic Controller) and the HMI (Human Machine Interface). Although they are often presented as one or two compact bundles, they consist of several levels – as shown in the following diagram.

The graphic shows the PLC program runs within the PLC hardware while, on the HMI side, a panel PC is widely used to deliver communication with the PLC or other systems and touch or multi-touch capabilities. This PC is running an operating system, more often than not one of the different generations of Microsoft Windows systems that are widely spread on machines around the world. Where zenon is used for the HMI solution, a zenon Runtime would be running a zenon project on the Windows operating system.

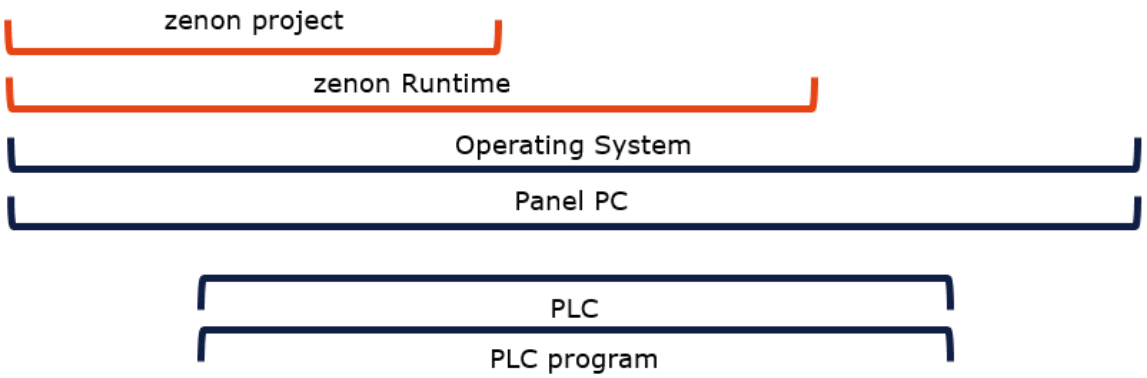

Figure 1: Components layers of a typical PLC and HMI application

During the lifecycle of the machine, it may be that the PLC programs are improved or updated to a new version, or perhaps the PLC is exchanged for a newer version.

When confronted with the need for a retrofit, an end-user must typically review the level of granularity with which the bundles of hardware and software components are implemented. In terms of the HMI, are the lifecycles of different components strictly connected with each other? Is the panel PC and everything inside effectively a “black box” or is possible to benefit from modularity and decouple component lifecycles?

3. Challenge: When your equipment becomes outdated

Often, companies follow the principle “do not change a running system” (or, in this case, do not change a running machine). However, what happens if the machine stops running because of damage to the Panel PC used for the human machine interface?

First, if the machinery in place is old it can be very difficult to maintain. Maintenance contracts might have expired, spare parts may no longer be available, or they may carry a high price premium or only be available with extended delivery times. To mitigate these problems, users may choose to carry various spare panel PCs in stock. However, the costs of carrying this extra stock can be high, especially in very heterogeneous machine environments, and need to be considered.

Second, if the machine breaks down, a longer repair time leads to higher downtime costs.

However, because in this scenario the software components of the HMI “bundle” are not damaged – only the panel PC hardware, a software solution that has a wider range of compatible hardware on which it can run is likely to offer greater scope to quickly get the software – and, therefore, the machine – running again.

When it comes to the software, the problem is more or less the same. Operating systems and other software systems often have limited lifetimes too. Changes may no longer be possible, or support may be discontinued. This will result in security vulnerabilities because security patches are no longer provided. For example, one of the operating systems we encounter frequently and seems to be still widely in use is Windows XP, which is no longer supported by Microsoft.

By sticking to old software systems, risks and threats arise. First of all, the software is more vulnerable to cyber-attack. So that these vulnerabilities aren't exploited by hackers, they cannot be connected to the wider plant network or the business systems – creating a closed IT system that misses out on the opportunities of the Smart Factory.

4. Solution: Prolong machine life cycles with zenon

Far-reaching compatibility is a key part of the zenon philosophy. One special form of compatibility zenon offers is its backwards compatibility. This means that old projects can easily be converted to a newer zenon version, without the need for many changes to the project.

zenon's backwards compatibility allows much more flexibility when replacing the hardware (such as the HMI display Panel PC) because the upper layers do not have to remain unchanged. For instance, if the new Panel PC or other replacement hardware requires a newer Microsoft Windows operating system, zenon makes it possible – indeed, easy – for it to be used. It is not necessary to re-do all the initial engineering work for the HMI because a suitable zenon Runtime for running the converted zenon project on the new operating system is always available.

As a consequence, the HMI element is no longer a bundle which requires a complete replacement of original parts – which risks those parts no longer being available. zenon projects can be decoupled from machinery parts with short lifecycles. As a result, the machinery as a whole can achieve a longer lifetime. The lifecycle of a zenon project can always be prolonged by zenon's compatibility.

The long lifecycle of a zenon project makes the entire HMI solution more durable and sustainable – with longevity at least as long as the stainless steel used to build the machine! The user can profit from new functionalities continuously as the zenon application is upgraded or as and when the HMI application needs to be changed or improved. And, of course, the up-to-date software also delivers up-to-date security standards.

5. Opportunities

By making use of the flexible compatibility of zenon, you can profit not only from longer lifetimes of your machinery but also new opportunities as a result of "rejuvenated" systems. By updating

your projects to the newest software version, you can make use of the newest functionalities in zenon.

zenon's flexibility also makes extending its reach very easy to achieve. You are able to develop, for example, your line supervisory systems by reusing parts of the zenon project. In this way, zenon helps to reduce engineering time. By leveraging your zenon application to build out from the control and monitoring solution of the single machine, you are also able to profit from a wide range of zenon technologies, such as: central overview and analysis of alarms and events, data historian across a complete line, centralized user management – and extend informational support for the operators, independent of location.

By designing an appropriate architecture based on the native zenon network capabilities, you can easily configure redundancy, provide data to remote or mobile devices, or share information with higher-level business systems. HMI applications can be integrated with parts of the plant OT/IT architectures and you can make steps towards a Smart Factory, based on Smart System Architectures: ergonomic, open, secure, flexible and scalable.

6. Conclusion

zenon's compatibility across different versions and operating systems supports end-users and machine producers to maintain flexibility and reduce the challenges associated with running components with different lifecycles. The investment in the project can be leveraged over the longterm, as a contribution to sustainable solutions.