

A difficult balance? – Standardization vs. flexibility

Food & Beverage: Implementing standards using zenon

Why is standardization so important in the Food & Beverage industry? Is such a dynamic and creative industry able to benefit from standardization at all? How can a regulated environment provide the flexibility necessary to repeatedly launch new products on the market, while pushing the limits of plant performance? Certainly, it is a great challenge to continue to comply with standards and, at the same time, support the dynamism and flexibility needed to move your business forward.

Mandatory standards and regulations such as those that provide a framework for the required quality level of food products, or the safety of the production environment, do not allow for the choice of whether to implement them or not. In order to be compliant at both a national and international level, their implementation is a must: essential for the existence of the production entity. However, compliance always provides an opportunity to off-set the costs of standardization, often by leveraging the opportunity to make process or system improvements that directly affect the TCO (Total Cost of Ownership) of Plant systems and Infrastructure.

International food manufacturers are increasingly working to standardize their entire production guidelines to ensure that their products are identical, no matter which country they are consumed in or at which manufacturing site they are produced. Professional standards organizations, such as the Organization for Machine Automation and Control (OMAC), develop comprehensive concepts for achieving interoperability of production equipment independent from the supplier. Engineering teams expect a reduction in the cost of integration and maintenance of systems, and flexible upgrades, when implementing standards at their production sites.

But do standards really always imply pragmatic results and practical benefits? Or, are standards always developed in representative working groups? How much do marketing, politics or the interests of certain companies or organizations influence the industry standards? If a choice is possible, it is the role of every management team to analyze and decide which standard to adopt in order to benefit in both the short and, more importantly, the long term. Whether it be through compatibility, repeatability, interoperability, or commonality, does standardization directly lead to more effective production and higher quality output at an



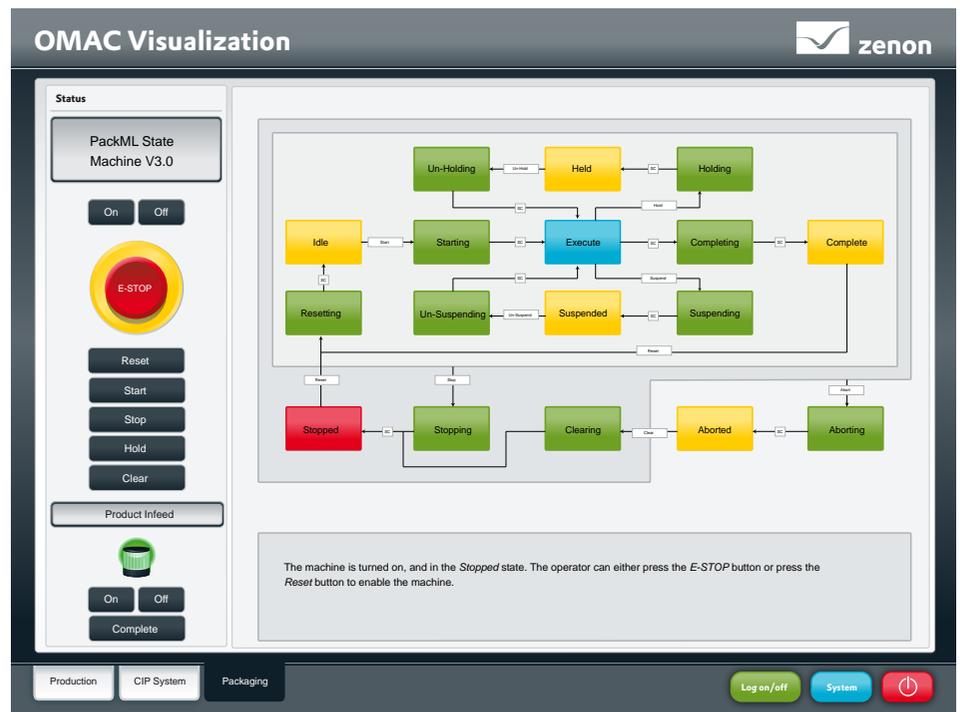


Figure 1:
zenon allows advanced engineering of
the machine state model visualization

optimized cost? Let’s have a look at some examples how zenon supports standardization in the Food & Beverage industry.

**STANDARDIZING TO GET
THE BEST OUT OF YOUR MACHINES**

Today, machine constructors face a great variety of demands from Manufacturers which they must aim to fulfill in order to stay competitive. The holy grail of manufacturing requirements is high reliability and performance with the best possible Return on Investment (ROI).

As a machine designer, you are challenged to choose hard working automation components that offer enough freedom to react to fast changing conditions, with minimum effort. Being a truly hardware-independent software, zenon allows you to select the most appropriate and effective PLCs, industrial PCs or interface panels for your machine.

At the same time, an increased standardization of machine modules and functionalities guarantees reusability and, thus, zenon reduces development costs. From out-of-the-box and configurable components, to a broad template-oriented approach to engineering, zenon gives you state-of-the-art tools for application standardization. The zenon wizards bring an advanced level of standardization, while offering the opportunity to customize certain aspects of the application. As a result, the engineering efficiency increases dramatically.

Example: OMAC is one organization which proposes standardization starting at machine level. One of its objectives is to achieve standardization of the machine state visualization model. A dynamic visualization of

the state model, as described in the OMAC standards, is a requirement for any HMI software. As shown in Figure 1, zenon’s advanced graphical tools provide appropriate support for the implementation of these standards.

zenon offers reusability through the easy creation and reuse of graphical elements, or ‘symbols’, fast “connection replacement” and XML import/export, all of which reduce engineering effort and allow for further improvement or change. The machine operator will also benefit from zenon – particularly its Chameleon Technology which provides skins that are easy to implement using centrally configurable and switchable color palettes. Their advantage? Better clarity of visualization and the information it provides.

Using zenon, it is easy to ensure machine and process compliance – while staying creative and flexible at the same time. Moreover, with only a few clicks you can share the dynamic real-time machine state model visualization across your plant network with all the appropriate people.

**STANDARDIZING TO GET
THE BEST OUT OF YOUR PLANT**

When a manufacturing plant is intensively focusing on quality, there are various standards that may apply, beginning with ISO 9000, continuing with Hazard Analysis Critical Control Point (HACCP), Total Quality Management (TQM) and FDA 21 CFR Part 11, right through to corporate and internally developed policies and procedures.

In the context of equipment effectiveness, a standard approach can

be achieved using strategies, concepts or philosophies such as Total Productive Maintenance, Kaizen, Six Sigma etc. The rich practical experiences in different industries with using these concepts have resulted in them being adopted by numerous Food and Beverage manufacturers. Standards such as DIN 8782 specify performance indicators which are making performance measurable and comparable. One very well known, and almost ubiquitous, Key Performance Indicator (KPI) is Overall Equipment Effectiveness (OEE).

The optimization of consumption in the production process is directly linked to sustainability concepts and is one more opportunity for a more standardized approach. For example, the DIN EN 16001 standard, published in 2009, relates to Energy Management Systems and provides manufacturers with a clear plan detailing how to continuously reduce energy costs in their plants.

But what are the common elements of these standards relating to food production plants? Firstly, adequate tools for their efficient implementation are necessary in order to collect the relevant process data, store this data, offer real-time and relevant information, analyze historic trends, and plan for evolution. zenon is designed to implement these requirements with fast results: always open and flexible.

Most of all, a software tool based on zenon is applicable in every plant thanks to zenon's openness – because the software allows connection to your old and new equipment. You have the freedom to consider any component within your system which has relevance to performance optimization. Additionally, zenon offers numerous modules which allow quick implementation without programming: data archiving, alarm

and event management, data processing and reporting, graphic trends, communication over the network etc. The flexibility to update or add functionality to the application at any time reduces constraints and increases engineering convenience.

Example: Real-time information is key for every system used to manage production. Relevant information delivered at the right time to the appropriate people facilitates informed decision making and ensures the appropriate action can be taken when it is needed. An advanced way to communicate real-time – or historic – key information to the production team is via the OEE Waterfall Diagram, implemented with zenon as shown in Figure 2. The diagram offers, supplementary to the OEE indicators, valuable orientation to detect hidden improvement potential for further equipment effectiveness improvements.

zenon supports the standardization of such tools across the production plant. On the one hand the Editor ensures speedy engineering and easy handling – even for non-specialists in software development. On the other hand, thanks to zenon's network technology, any updates can be done at a single point (on the server) and can then be automatically propagated to the other (client) computers, including mobile devices.

CORPORATE STANDARDIZATION

TO GET THE BEST RESULTS

How can big corporations manage various production locations when performance benchmarking and process compatibility have the highest priority? What are the common elements which, when available in every plant, harmonize communication content and information flow to sup-



Figure 2:
Identifying improvement potential
with zenon by standardizing the
OEE Waterfall Diagram

port standardization? One solution is a corporate roll-out of a standard automation system, whether it be an Equipment Performance System or an Energy Management System. Such a roll-out supposes corporate-specific standards for every software application, covering user interface, symbols, color conventions, machines and their data tags, functionalities, KPIs, Measurement Units, Reports, international language terminology, communication protocols and so on.

A pragmatic approach to the standardization of machine tags and system functionalities in the Food and Beverage packaging environment is provided by the Weihenstephan Standards. The compliant machines and data acquisition systems are clearly defined, with the benefit for manufacturing plants to optimally integrate production equipment from different suppliers.

It is exactly for such requirements, that the zenon standardization wizard technology offers state-of-the-art support. The wizard programs are designed to ensure the compliance of the application with the respective standards, but they also offer the possibility to configure all those elements which differ from plant to plant in a customized way, for example: which machines are located in a given production area, which specific functionalities are needed and so on. Figure 3 illustrates the principle of zenon’s wizard technology when applied to the corporate standardization and roll-out of automation systems designed to increase productivity and optimize consumption.

Today, it is usual for an international corporate group to have a network infrastructure allowing internal communication (Intranet, VPN). Integrated over such a corporate or plant-wide facility, zenon offers ad-

ditional possibilities, including centralized production data storage and centralized application-source management – see Figure 4. To aid Production Management, the real-time or historic benchmarking indicators (e.g. OEE, or ratios such as energy consumption relative to production) and comparison reports, stored centrally and reliably, are made available transparently at every location where they are required. To aid the automation engineers, the multi-user engineering of zenon supports the change management of standard elements and of all local applications. This way, the engineering of your application can be tailored to meet the individual security standards of your business.

STRIKING THE DIFFICULT BALANCE

As we have seen, standardization is hugely important for Food & Beverage Manufacturers. With the right tools, a regulated environment can drive process and performance improvements – even in this dynamic sector, where creativity and flexibility are highly prized.

We’ve looked at several levels at which standardization is important: at a machine level, system level, plant level, conceptual level and at a corporate level. Let’s have a final look at the main advantages zenon offers when standardization, in all its different guises, is applied in Food and Beverage manufacturing:

- ▶ At a machine level, because it is a truly hardware-independent software, zenon allows for the free choice of the most effective PLCs, industrial PCs or interface panels for your machine.
- ▶ At a system level, zenon’s native philosophy of standardizing and reusing application components reduces engineering costs.

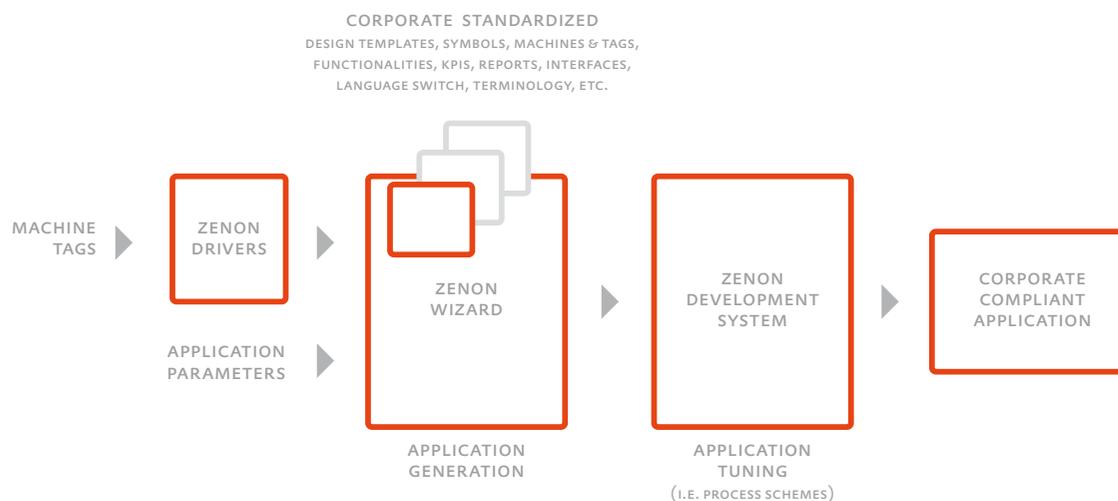


Figure 3: Corporate standardization & roll-out based on zenon Automatic Engineering

▶ zenon’s template approach to engineering delivers state-of-the-art tools and components, which facilitate application standardization; ensuring compliance with both internal norms and third party application standards like OMAC’s machine state visualization model.

▶ At a plant level, zenon’s openness ensures full network integration of all automation components, regardless of their stage in the development and innovation lifecycle – delivering the complete view of the entire Plant essential for meeting quality standards like ISO 22000 and HACCP.

▶ At a conceptual level, the adoption of performance philosophies like TPM, six sigma and OEE mean Production Management have come to recognize the automation system’s critical role in ensuring the right information is delivered to the right people at the right time. zenon’s reliability, enhanced reporting tools and flexible network architecture make this a reality. Out of the box and configurable zenon modules make it easy to use zenon as the key tool to implement and measure compliance with standard-based approaches for high quality, effectiveness and optimized consumption.

▶ Moreover, zenon’s built-in redundancy and flexible network architecture ensures users have the system reliability they need in order to drive performance improvements – whichever philosophy they subscribe to.

▶ At a corporate level, zenon’s simple standardization and customization of automation components, its Chameleon Technology, flexible multi-user engineering and numerous wizards mean a standardized, multi-site and multi-functional corporate automation system roll out can be truly cost effective.

▶ Through automatic engineering, zenon makes the corporate-wide roll out of standardized automation applications fast and reliable.

It is clear that zenon helps its users to implement and adhere to a wide variety of standards designed to improve performance, whilst leveraging tools that help drive down the cost of engineering and the TCO of the automation system. Perhaps it is more accurate to say: with the right tools, a regulated environment can drive process and performance

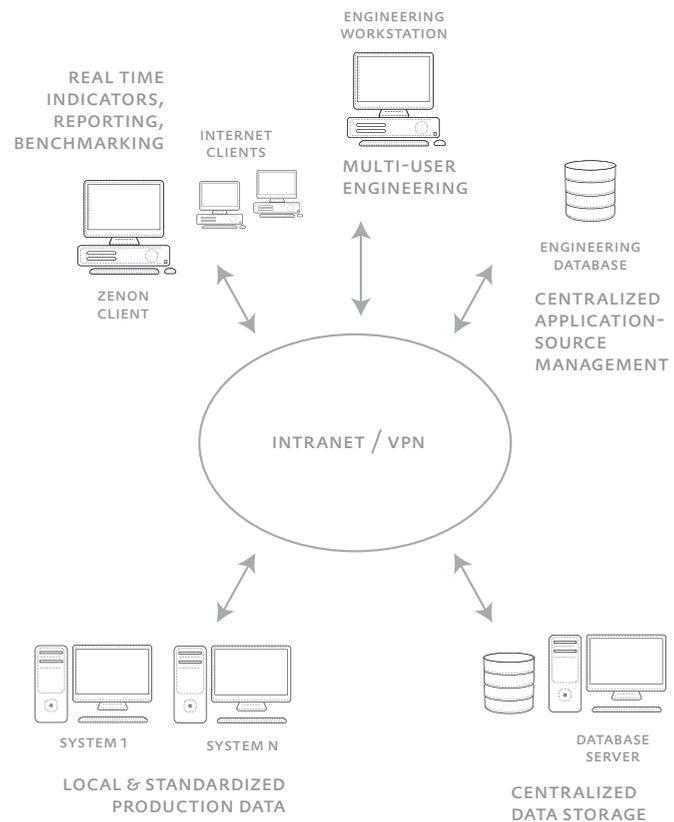


Figure 4: zenon supports corporate-wide benchmarking and application change management

improvements – especially in this dynamic sector, where creativity and flexibility are highly prized. With the right tools at hand, the difficult balancing act between standardization and flexibility turns out to be more like a rational and synergic pairing.

I’d love to hear your feedback. Send me your thoughts at: EmilianA@copadata.com.  **Emilian Axinia**