White Paper

Digital added value via Kastor DataCockpit

Data analysis and data evaluation

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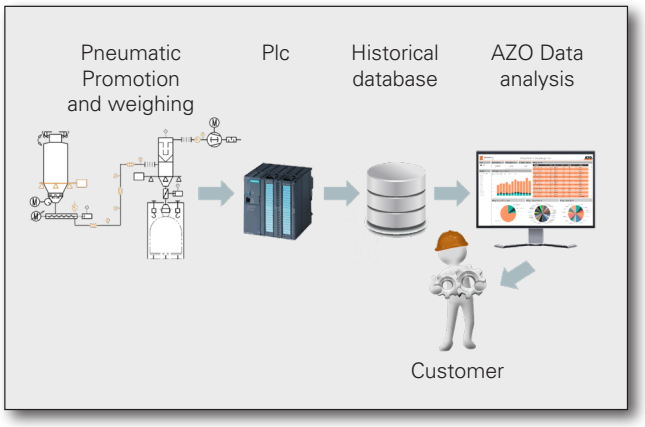
Introduction

Many of our customers have highly automated processes that are controlled by a process control system such as the Kastor production management system from AZO. Over time, these control systems produce an inordinate amount of data. Some customers have several gigabytes of data stored in their databases.

These data are valuable, but it is difficult to unlock their potential. If you try to evaluate such vast quantities of data using lists or similar means, you are simply overloaded with information.

It is therefore necessary to find a completely new approach. This is where the topic of smart data comes in. New technologies in the field of data analysis and evaluation are being put into practice. These are technologies which we are already familiar with from daily contact with congestion forecasts of navigation systems, for example.



What is data analysis?

Generally speaking, data analysis involves deriving useful findings from data. To do this, various techniques are used to restructure, organise and present the data, so that relationships and dependencies in the data become visible and the results can be used as a basis for production optimisation.

Data analysis itself can therefore be classified as a dedicated method or technology within the context of improving production systems.

Data security is the top priority.

Quotation:

> »You can have data without information, but you can't have information without data«

Daniel Keys Moran, programmer and author

What are the benefits of data analysis?

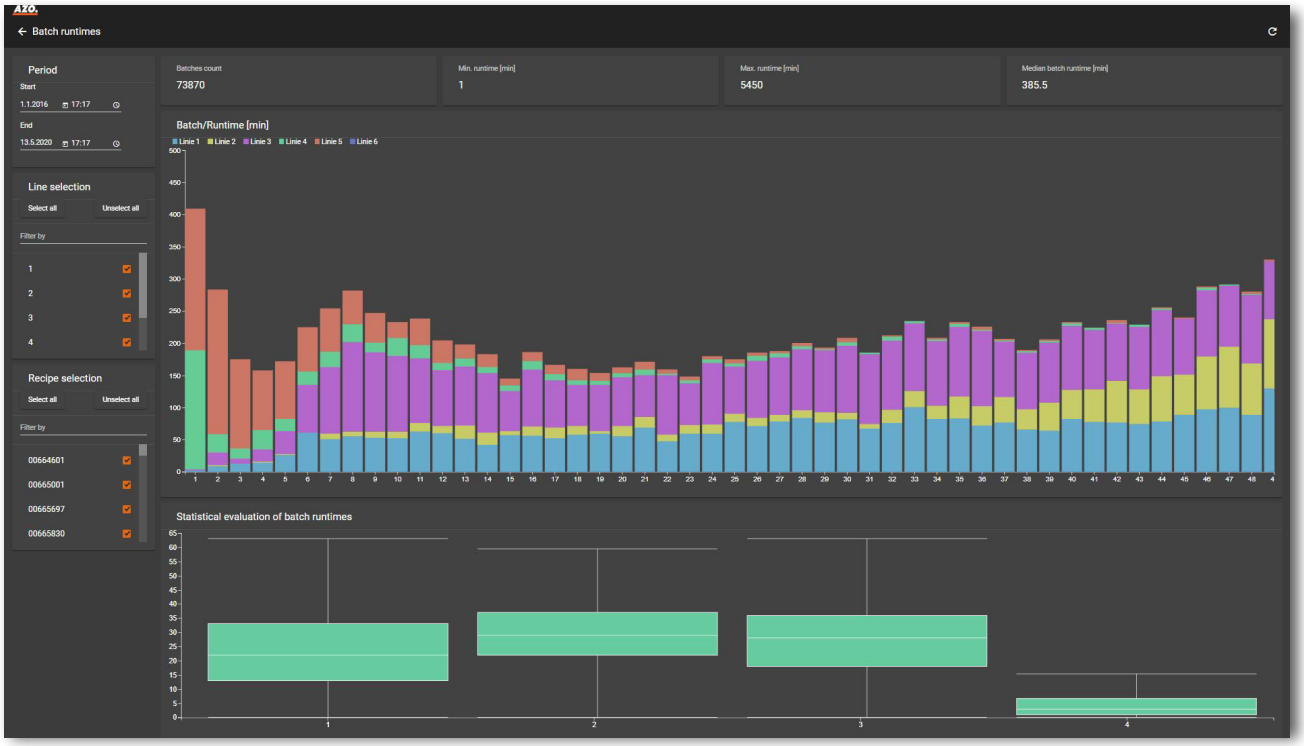
The benefit of data analysis for our customers is largely in the added value from previously unused data created during operation of AZO systems or other system components.

New insights into potential for optimisation, highlighting possible weak points or how to prevent faults – data analysis provides our customers with a solid foundation for permanent improvement of their AZO system or system components.

Use Cases

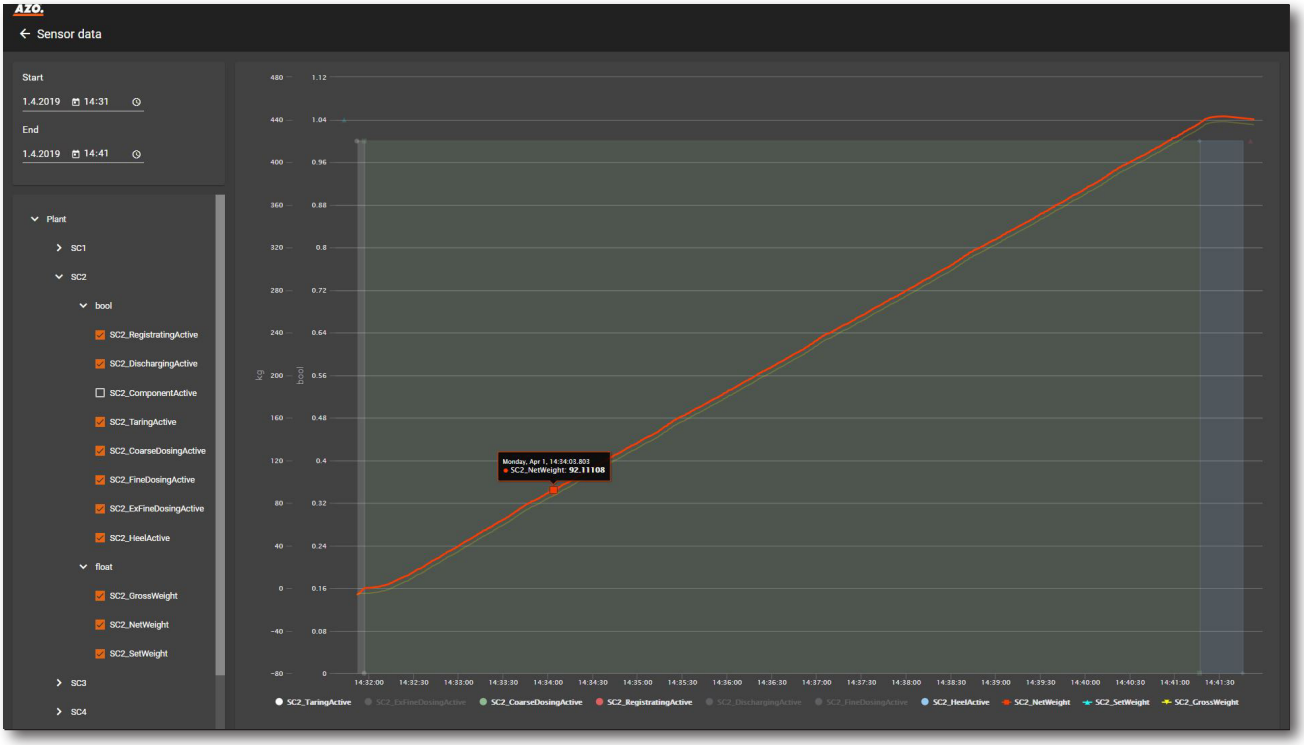
Creating transparency:
Data analysis allows you to visualise running times of recipes to identify whether problems have occurred with particular batches. These can then be localised so that particular attention can be paid to any stoppages in certain parts of the system.

Subsequent fault analysis makes it possible to identify the causes and creates transparency. By eliminating the recognized problems, throughput can be permanently increased.



Use Cases

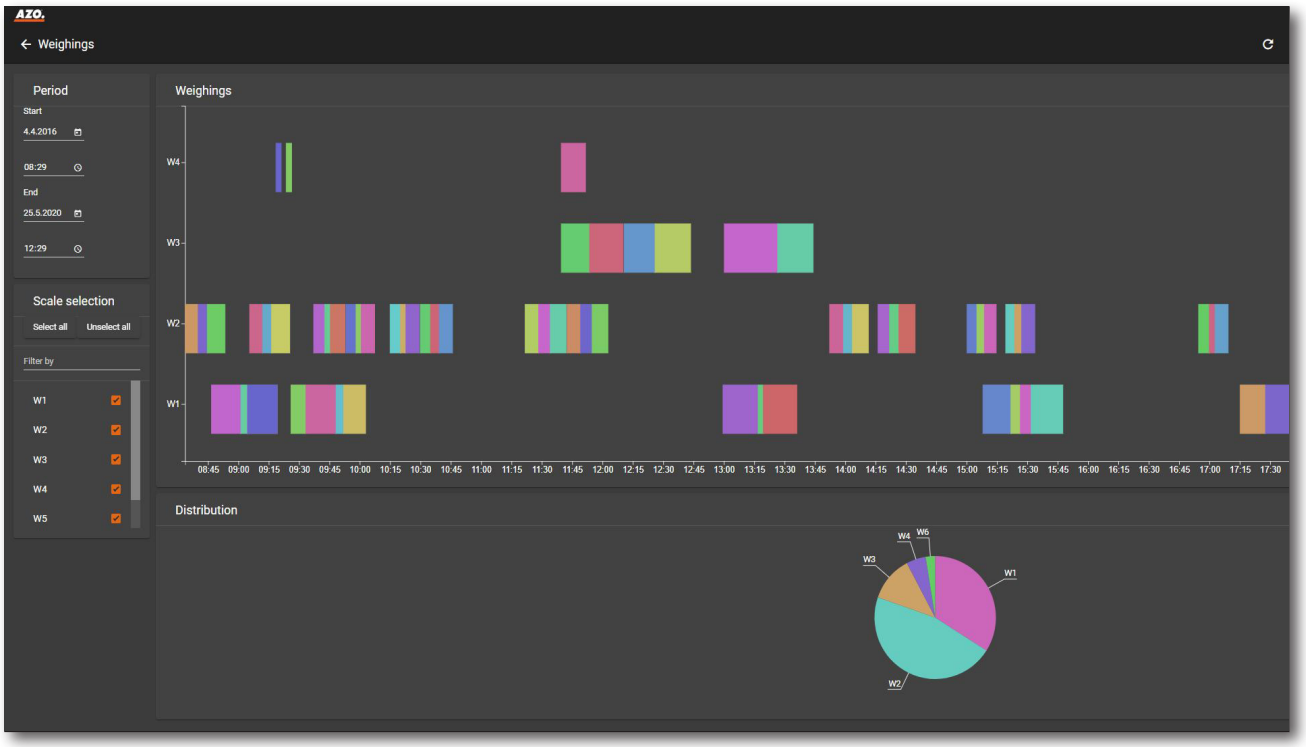
Increasing efficiency:
Processes/timings of particular system parts are displayed. This enables you to detect, over the running time of the system, whether certain timings change – for example procedures may become longer – thereby promptly identifying that this signifies a problem to which it is then possible to react in advance. These preventive measures in production make it possible to obtain long-lasting efficiency.



Use Cases

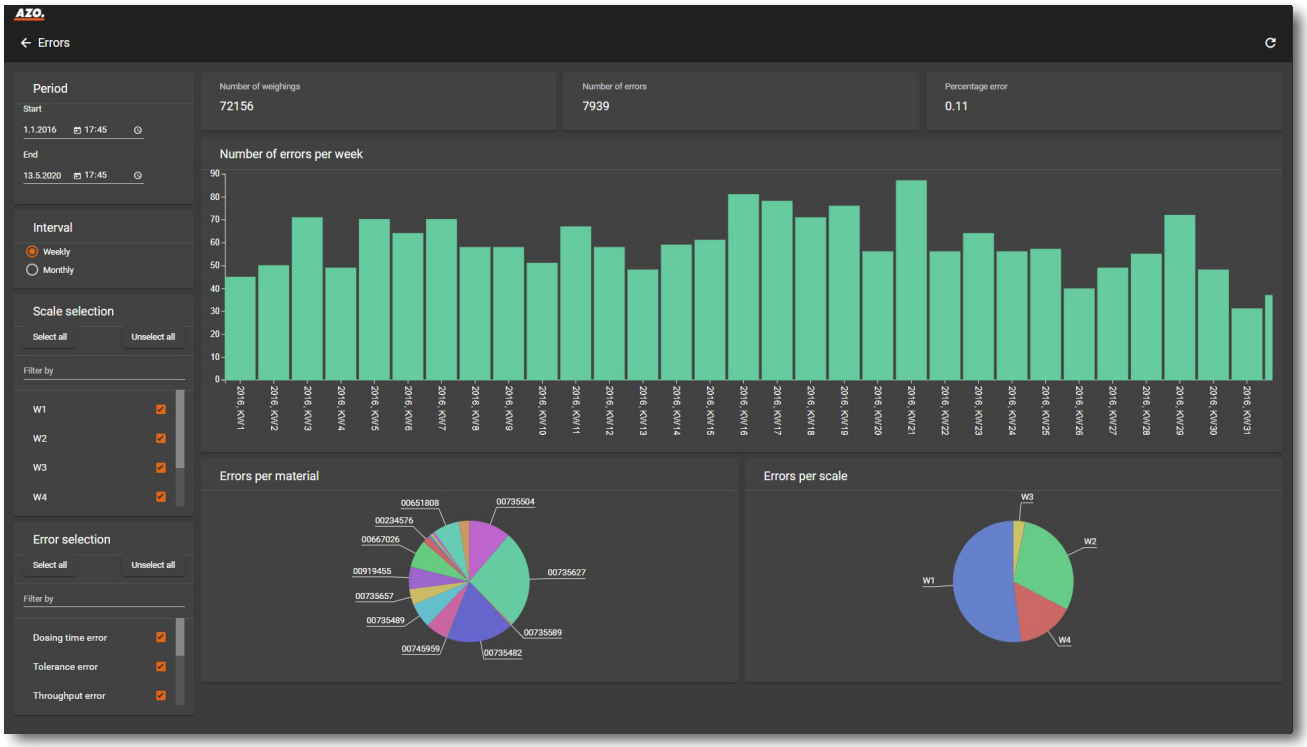
Increasing quality:
The weighing variances of millions of weighing procedures are stored – so you can derive trends, for example whether these variances increase over the year. The reason for this could be a system error or incorrect maintenance.

Targeted plant maintenance would provide the necessary remedy.



Use Cases

Improving availability:
The system also stores errors, however. These could be tolerance violations or dosing time errors, for example. These all result in a brief stoppage of the system. If you could avoid, say, 50 % of these errors by setting the system parameters better, you can imagine the enormous potential.



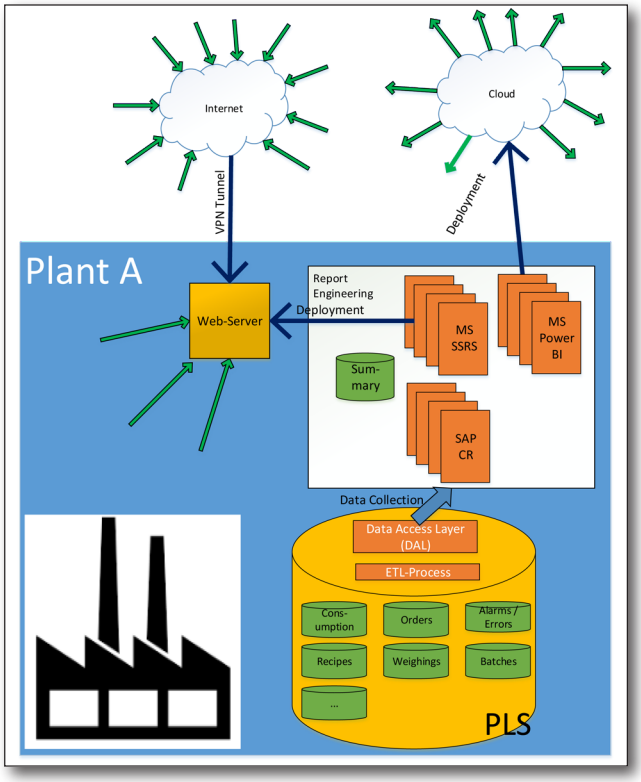
Different features for different customers

Since our customers cover the full range from small and medium-sized enterprises (SMEs) to large corporations, it was important to be able to offer the right solution for all our customers. We have therefore taken a layer model as a basis and used it logically. As a result, different levels of signal processing can be used flexibly, or hidden or exchanged as appropriate.

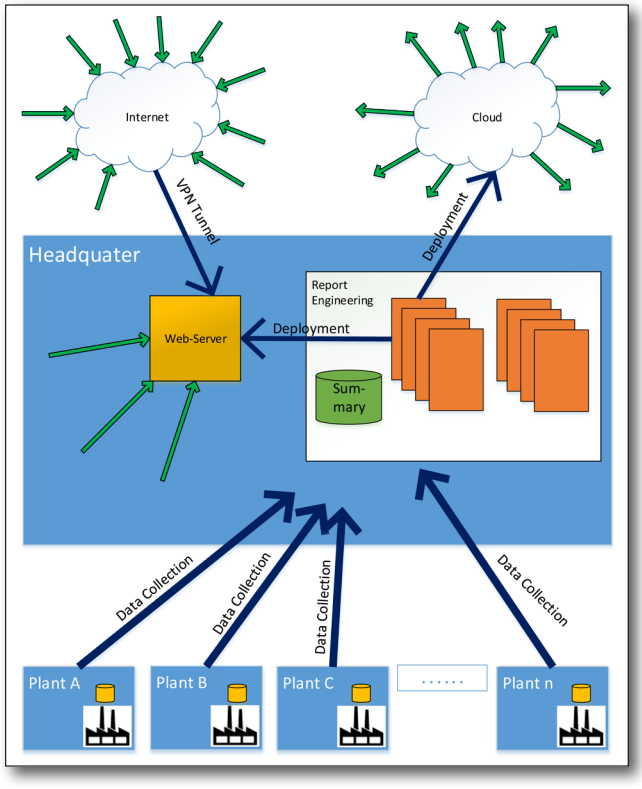
For an SME, a local solution with local presentation of the data is the right solution. In this case, all layers are provided by AZO.

In the case of a large corporation, the data must be presented on a global scale. In this case, the data capture, transformation and processing is carried out by AZO. Presentation makes use of the media in standard use in corporations. The preprocessed data are then made available via an interface.

In a corporation, it is also important to be able to compare different sites. The sites may have a different infrastructure. To address this, the data are standardised appropriately and prepared for evaluation and comparison. The data can be prepared either locally in each site or centrally.



Solutions for small and medium-sized enterprises



Solutions for large corporations

Data security

In order to ensure data security, data processing always takes place in the local system as a first step. Here, the data for evaluation are taken from several data sources, which may be differently structured, combined in a destination database and standardised. This processing step is the basic prerequisite for data analysis.

At this point, data security is ensured by authentication and secured protocols.

If the data need to be transferred for evaluation to other sites (group solution), this is always done using secure channels.

All access to the data requires a password in all cases. The data can be presented using a web server. In this case too, access is restricted.

Where are we now?

For more than 3 years we have been working intensively on this Topic. The ideas have flowed into structures. After various re-design phases, the basic platform is set. Now the technology will be optimized gradually. Further functions will be implemented. At the recent run of trade fairs, we demonstrated the initial results from our project "Kastor DataCockpit".
After a pilot phase the product is now available and actively in use at the first customers. The feedback we received was uniformly positive. Whether there is ever „a full functional scope" is quite questionable.

Since the pilot phase existing functions have been consistent optimized, improved and expanded. Additional functions have to be implemented. There will be a similar dynamic process, as we know it as a mobile phone user. Permanent updates with new or improved functions are the way ahead. Further updates are already planned in the coming months.