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Let's talk:

Data analytics in plant engineering

Interview with Dr. Anne Bendzulla: Using “digitalized expertise” to optimize planning, analysis and documentation over the full life cycle of an industrial plant.

Data analytics is a hot topic in industry, and particularly in plant engineering. It is growing in importance as companies, processes and products are increasingly going digital. How is data analytics used at thyssenkrupp Industrial Solutions AG? What advantages does it offer for

customers? Chief Digital Officer Dr. Anne Bendzulla has been driving the digital transformation of the global plant engineering company since April 2018. Her commitment was recently rewarded with this year's "Vordenker" award for visionaries presented by Handelsblatt and the Boston Consulting Group (BCG).

Dr. Bendzulla, what exactly is data analytics?

It's about collecting and analyzing large amounts of diverse data in order to identify hidden patterns, unknown correlations and other useful information. This information can be used to develop recommendations for action that can provide a competitive edge and other business advantages.

In particular, data analytics opens up great possibilities for the operation of large-scale plants. For example we are currently developing applications that will make it possible to run plants at the optimum operating point at all times. That will significantly reduce consumption of operating materials and supplies on the one hand and at the same time maximize production volumes.

What other benefits does it offer for customers?

By analyzing vibrations, flow rates and temperatures, for example, we can already check for unusual operating conditions and anomalies. These data are forwarded directly to expert systems which assess the results and identify potential component malfunctions before they can actually cause breakdowns or damage. In this way targeted maintenance can be carried out on individual components before problems occur.

The products themselves can also be optimized. Recording production and product parameters online makes it possible, while production continues, to avoid both quality issues and overfulfillment of targets. This assists the efficient use of resources.

Last but not least, data analytics is also used to analyze external conditions. For example, when exceptional weather conditions are forecast the operating mode of the plant can be adjusted in good time. Dry periods with resultant low river levels may impact supply logistics for industrial facilities. Action can be taken to prepare for such scenarios.

Those are some impressive advantages. What is needed to use data analytics?

The first step is to collect and prepare a solid database, for which quality comes before quantity. It's important to collect those data that are regarded as key to system condition and product quality. A wide range of sensors is already available in this context: For example, a modern fertilizer plant has over 1,000 sensors that continuously analyze production equipment and products. Data volumes of several gigabytes per second are nothing unusual.

This is the basis for an adjusted dataset that is available for analysis and serves as the starting point for the creation of a "digital twin". This "digital twin" is used by all involved for planning, analyses and documentation over the entire life cycle of the plant.

During analysis, it is important that the data are interpreted efficiently. For this we transfer the engineering and process expertise and wealth of experience of our engineers to databases, expert systems, algorithms and neural networks. During plant operation these are capable of differentiating between critical and non-critical deviations and developing tailored recommendations for action. Engineers review and amend these recommendations and provide valuable input aimed at further optimizing our sensors and analytical tools. At thyssenkrupp Industrial Solutions we call this “digitalized expertise”.

Ideally, suppliers and customers should also be involved in the simulations and analyses. The trend is towards greater cooperation and data transparency, which in turn unlocks potential for increased efficiency.

For more information: <https://www.thyssenkrupp-industrial-solutions.com/en/digitalized-expertise>



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