Process Optimization with data intelligence

TECHNOLOGY SHEET

Process optimization with data intelligence

Technological advances have made collecting, processing and analysing data much cheaper, easier and more accessible. Organizations can become smarter using the knowledge and insights they acquire from such data, potentially benefiting those around them.

It is worth bearing in mind that data alone do not generate value. Data by themselves are only numbers or parts of a text. We always have to make the leap from data to value, and that doesn't happen just like that, but takes time, money and ingenuity. Value only arises when you solve a specific problem or manage to eliminate a specific pinch point. The main challenge is to find and then answer the right question.

You must be constantly asking yourself what you can learn from the data and – perhaps more importantly – what actions you can take once you find what you are looking for. Only when you can actually translate the knowledge you have acquired into practical action will you create value.

Data Action Value
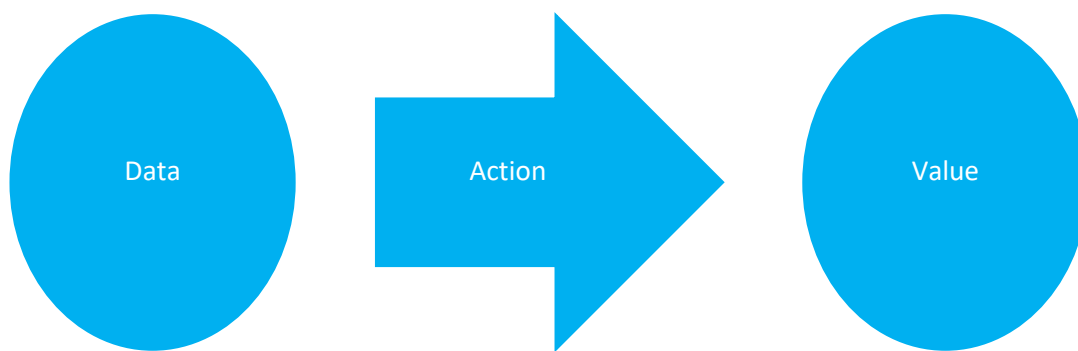
Take, for example, an indicator light that can be red, amber or green, depending on a machine's temperature. If you take no action when the light changes colour, then the light is to all intents and purposes redundant. The light turns a particular colour based on underlying data, and therefore yields information and knowledge, but if no action results from this, all the previous steps will ultimately have been in vain. This may even have disastrous consequences, with a fire starting, for example. Taking action based on the knowledge acquired through data is essential.

Process optimization with data intelligence and reduction of lead time

It is a challenge for organizations to face up to their actual situation, given that while those working for a company often think that their processes run smoothly, in real life these often diverge from the ideal scenario. People within an organization may have 'feelings' about these differences, but it is difficult to put one's finger on the problem without any concrete evidence.

Data enable organizations to understand their processes as they really are, rather than looking at them through the prism of human interpretation. The data map actual processes so that they can be monitored and analysed. This helps identify deviations, bottlenecks and improvements to processes.

Structuring the data – and, associated with this, the knowledge and insights gained about the processes from the data – can reduce lead times. If an organization maps processes' actual trajectory, it can assess how long each phase in the process will be. In this way, an organization can take a critical look at all

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processes and steps that take too much time, cause delays and may even be unnecessary. As such, the organization can take measures to reduce lead times.

QRM assumes that a company-wide focus on shortening lead times results in a positive impact in terms of quality and price. As just described, lead time reduction is one of the potential benefits of well-mapped data-driven processes. In addition, effectively mapped processes can help foster a QRM mindset. Data (e.g. data visualizations or data-driven analyses) can help raise awareness of the negative consequences of long lead times for business management.

Fields of application

Various examples of practical applications are set out below, to illustrate how lead times can be reduced by making use of data.

Real-time insight into processes: In QRM, good cooperation between cells is vital. If cells have a real-time insight into each other's processes, they can work together to offer the customer more rapid assistance. For instance, cells can respond promptly and proactively when another cell needs help and have a look at what has happened to orders. In this way, sales staff can manage expectations appropriately and always have an understanding of the worst-case scenario. Products arrive with the customer faster and do not remain in the warehouse for long periods unnecessarily.

Validation of the manufacturing critical-path time (MCT): Organizations can check whether their actual lead time matches the forecast MCT lead time. Deviations can be analysed. If the actual time of a particular phase is significantly longer than the forecast MCT lead time, action may be taken. It is vital to also have a good overview of the office lead time. For example, one company did not realize that it took almost 13 days for an order to reach the business. For them it felt like only a few days. An understanding of the data enabled them to discover that a lot of profit could be made here.

Predicting orders: By drawing on historical order data and using algorithms, it is possible to predict those orders that are most likely to be placed. Anticipating this in the production and delivery process can significantly reduce the lead time. This includes moving and ordering stocks on time so that this has no negative effect on the lead time and a quick response is possible when production actually needs to take place. A company like Amazon has already come a long way in this regard and is even considering shipping products before they are actually purchased.

Identifying manual steps: Manual steps, interventions or errors can increase lead times. Organizations can identify these steps in a well-mapped process and take action to reduce errors and shorten recovery times. They can also check whether manual actions can be automated. Automation involving robots has a number of key benefits that reduce lead times. These robots work 24/7, with no breaks or holidays. They also operate without there being any possibility of human error that must be corrected.

Detecting congestion: QRM focuses on optimizing workflows. Data can help you establish which products, teams or suppliers cause delays and where there are inefficiencies in the production process. In practice, the right actions – using Celonis software (www.celonis.com) – have led to a 22% reduction in production lead times, addressing, for instance, the problem of machines which continue running for too long and so require extensive maintenance to be carried out and the production process to come to a standstill. Such downtime can be avoided through smart maintenance planning based on the collected data.

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Need some help?
The Interreg project QRM4.0 supports production companies in improving their lead times by providing practical advice and granting financial support to companies that want to take steps to implement digital tools on their shop floor. Would you like to know more? Contact jim.bemelen@zuyd.nl.