PRESS RELEASE

The Digital Twin is Showing its Teeth

Innovative module from c-Com: Machining Analytics Solutions

To detect problems in manufacturing quickly and guarantee quality, c-Com bundles all available data concerning the machine, tool and workpiece for analysis with artificial intelligence (AI). The new module Machining Analytics Solutions (MAS) supports the production process with a digital twin and is especially interesting for hobbing tools.

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By means of a DMC code, c-Com digitally stores data on a tool. ©MAPAL

Tool breakage rarely happens out of the blue. Before a tooth of a gear hob snaps, the mishap is often heralded in advance by a combination of characteristic values. For trend analyses, the Machining Analytics Solutions (MAS) module from c-Com evaluates the data in real time and warns the user that something is going wrong in the production process. Based on this information, machining can be stopped in time, the expensive milling cutter can be saved from damage, and the workpiece can be preserved.

The adaptive programme builds on two other c-Com modules, Digital Tool Management (DTM) and Life Cycle Management (LCM). In MAS, c-Com has incorporated the positive findings from the first two modules and enriched them with AI. The starting point is the digital twin of the tool.

Data exchange across company boundaries
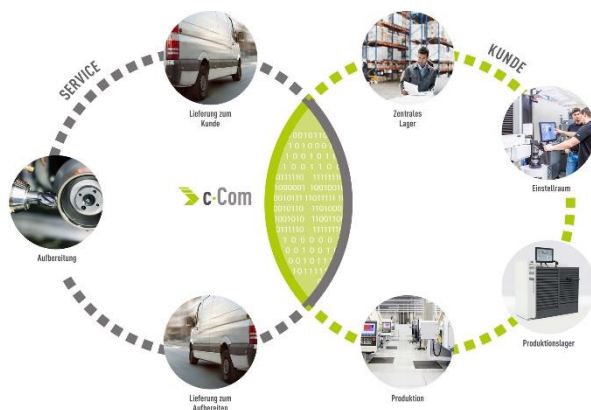
The c-Com platform tracks the process flow and records which path the tool takes, where it is used, and who works with it. This captures the entire life cycle in its depth. ©MAPAL

C-Com tracks the process flow and records which path the tool takes, where it is used, and who works with it. This captures the entire life cycle in its depth. The platform makes it possible to share the digital twin across company boundaries as well. A hobbing tool passes through numerous stations in a preparation process. It passes repeatedly through regrinding, coating, the integrator and back to the customer. "By making the central digital twin available, we guarantee that everyone involved in the process always has access to the real-time data for the tool," emphasises Bernhard Schuster, Team Leader Project and Application Support.

Ideally, c-Com is integrated, so that the data are gathered in the background. "We're able to set up the data structure to suit the specific customer," explains Business Development Manager Matti Maier. "There are core parameters for each tool, but beyond that, customers have a wide range of individual data and parameters that we can incorporate very flexibly without changing existing structures." è

There are some 70 different parameters for a large hobbing tool. Typing them manually into a table or a controller is time-consuming and fraught

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with errors. In addition, the ERP systems of the companies usually only contain the stocks of tools, but no information about their respective status. This makes it difficult to plan production capacity. Since delivery times of up to 20 weeks are not uncommon for hobbing tools, unnecessarily large contingency stocks are often created, tying up capital.

Entire life cycle map for each tool

c-Com creates greater transparency by including application data. Among other things, tool tracking records how many tools are in circulation, how they have already been used, how long their residual tool life is and how often they have already been reconditioned. "With our solution, we document the history completely and can say, for example, how many parts the existing production capacity is still sufficient for," says Bernhard Schuster. If premature tool breakage occurs, or the tool's performance falls short of expectations, the digitised hobbing process provides explanations. The aggregation of the data for entire tool groups provides further information. For example, if a tool life changes on average, the trend analysis reveals a problem in the process.

The c-Com software supports the manufacturing staff in their daily work and ensures higher productivity through valuable information.
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During validation at a large car manufacturer, it became clear what the AI in the MAS module is capable of. Engineers there had tried in vain for a year to find the cause of a quality problem on a workpiece. Within four weeks, c-Com's analysis led to a solution. With multi-dimensional correlations, AI clearly shows its superiority over humans. N

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