



Toolmaking of the Future – Digitalized and Sustainable

What the Two Trend Topics Mean for Collaboration between Toolmaking and Series Production

The toolmaking industry of the future is facing significant changes in its range of services and its value creation processes. It is difficult to predict exactly how the collaboration of German tool manufacturers with series production will be structured in the future. However, it can be assumed that digital networking and sustainability will play a key role.

The toolmaking industry in Germany is facing a variety of different challenges in 2021. Even before the Corona crisis, the market for new tool purchasing tended to act in a wait-and-see manner – at the same time, more and more high-quality international toolmaking companies are entering the market, many of those have now established their own service locations in Germany.

The Corona crisis has led to a further delay in the recovery of the global tool demand. Therefore, the long-term development of the toolmaking industry beyond this time is difficult to forecast and depends on a large number of different influencing factors. However, it can already be identified that all development scenarios have two content-related commonalities.

First of all, digitalization: in the long term, toolmaking companies can only secure their competitiveness if they significantly increase their efficiency and realize new differentiation factors. Both are only possible with digitalization, as the potential of classic lean methods has largely been exhausted and international competitors are increasingly adapting existing differentiation factors.

Besides, sustainability: up to now, political and social sustainability activities have only had a very limited influence on the toolmaking industry. However, since series producers and capital providers are focusing increasingly on sustainability, there is an acute need for action for the toolmaking industry to ensure access to new orders and capital in the long term.

The two aspects digitalization and sustainability will be explained in detail regarding their significance and implementation in toolmaking.

Digitally Connected Internally and Externally according to Requirements

The digitalized tool shop is connected internally and externally according to requirements to make its own value creation process more efficient and to increase the benefits for series producers. The WBA Tooling Academy target image of a digitalized tool shop describes how the design of concrete applications for realizing the benefits of digitalization in toolmaking has to take place (Fig. 1). In addition to the tool shop itself and the series producer, external value creation processes of suppliers also have to be taken into account.

Possible use cases of digitalization are classified in the four maturity levels of

- visualization,
- transparency,
- forecasting and
- adaptability.

Solutions for the visualization of data (e.g. display of machine data) represent the entry into digitalization, as they already require an available and cleansed database, which is mandatory for all further levels. Based on this, transparency about the causes of conditions can be created by identifying correlations in the database (e.g. factors influencing the life cycle of milling tools). Knowledge of this enables a forecast of these states, which forms the basis for an automated reaction to a forecast system state (e.g. avoidance of tool breakdown).

Based on the benefits, the IT perspective of use cases have to be designed. This is often not visible to the actual user, but it requires the greatest effort during the development phase. The IT perspective is designed on the levels of data sources, middleware and data analysis. For this purpose, data from different systems often have to be examined and newly collected in toolmaking (e.g. planning and machine data). To aggregate data, middleware is required to pro-

vide the data from different systems for analysis and utilization. In addition, toolmaking companies must address the organizational (e.g. qualification of employees) and technological (e.g. framework conditions for using tablets on the shop floor) enablers of the solution. This provides the basis for successful implementation or use of a solution.

The digitalization not only supports toolmaking companies in increasing their own efficiency and the benefits for the series producer, but it is also a central enabler for true sustainability. By creating transparency along the entire life cycle of a tool (tool development, tool production and tool use) and across all stages of the value chain, sustainability can be evaluated and optimized in a valid manner.

Toolmaking as an Enabler of Sustainable Series Production

The implementation of sustainability demanded by series producers and capital providers poses a great challenge for the toolmaking industry. In the WBA study "Competitive Factor Sustainability – A Differentiator for the Tool and Die Industry", it is described how toolmaking can increase its own sustainability in the future as well as the sustainability of the »

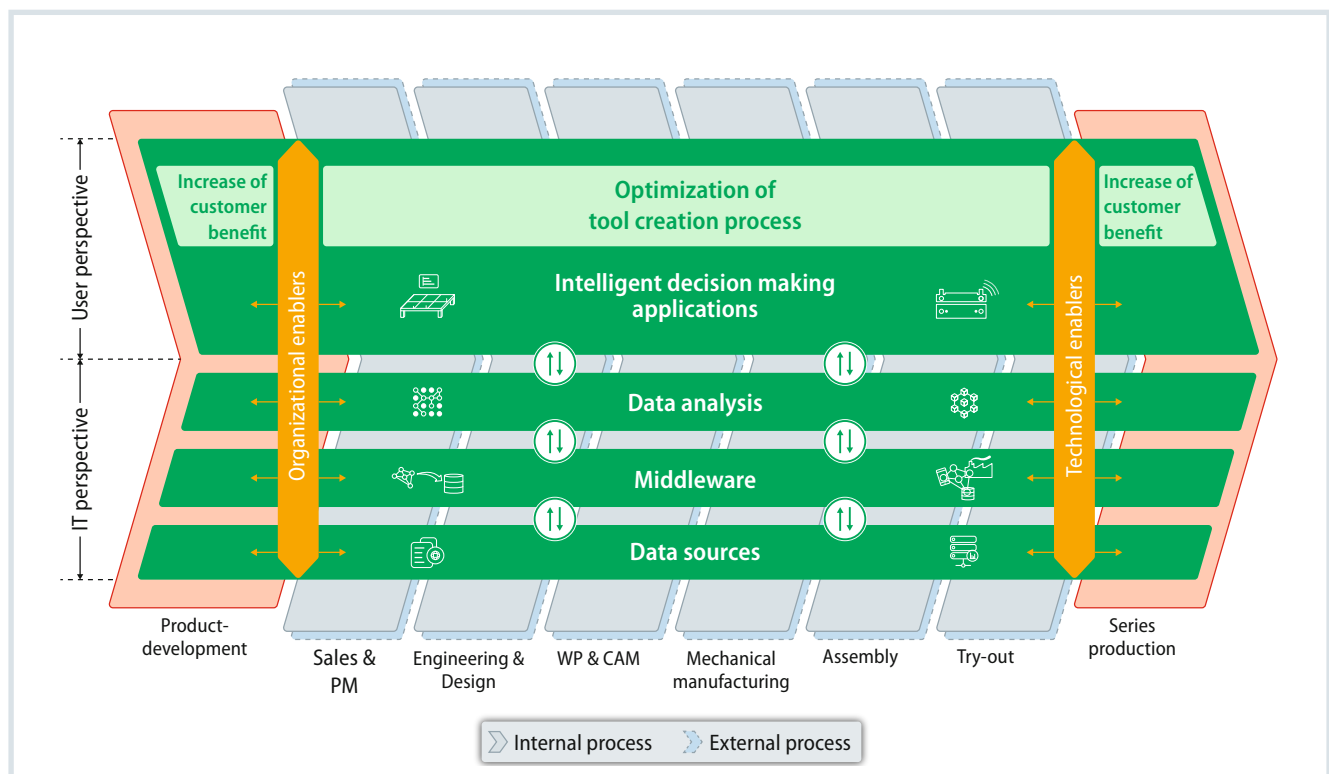


Fig. 1. Target image of the digitalized tool shop to increase its own efficiency and support the series producer Source: WBA; graphic: © Hanser

series producer. For this purpose, a target image was developed that shows the fields of action of sustainable toolmaking and that is intended to serve as an introduction for toolmaking companies to the topic of sustainability (Fig. 2).

In line with the target image, the fields of action service range, resources, process and employees are no longer to be optimized from a financial perspective alone, but against the background of the "Business Case for Sustainability". This means interpreting the eco- and socio-effectiveness demanded by stakeholders against the background of entrepreneurial thinking as eco- and socio-efficiency. In total, the terms eco-efficiency and socio-efficiency summarize the symbiosis of ecological, social and economic aspects in order to make sustainable actions of toolmaking companies economically attractive. With the sustainable design of the service range, toolmaking companies primarily pursue the goal of supporting the series producer in its sustainability.

In addition to measures implemented directly related to the tool, such as the insulation of an injection molding tool to reduce the tempering effort, these measures also include more far-reaching activities in the process. These can include, for example, the material selection of the article or completely new services, such as the reuse of tool components.

With the other three fields of action, resources, process and employees, the toolmaking company ensures that it will be able to provide its services more sustainably in the future, when compared to the competitors. This is of particular importance, as in the future, to ensure their own sustainability, series producers will evaluate sustainability performance in addition to tool price when procuring tools. Initially, this will manifest itself in general certifications and audits. Customers will demand proof from toolmaking companies so that they are generally considered as a supplier. In the medium term, however, this will express itself in a tool-specific assessment of CO₂ emissions and then holistic sustainability, which will be assessed quantitatively.

Summary

The future development of collaboration between German toolmaking companies and series producers will be determined by a variety of influencing factors. All development scenarios have in common that they will be characterized by digitalization and sustainability. To be able to successfully exist on the market in the long term, toolmaking companies must therefore take the following steps to get started in the two topics.

Firstly, a strategic definition of use cases for internal optimization and increase of customer value based on digitalization is necessary. Besides, the implementation of prototypical applications based on already existing data, to generate a basic understanding is useful. As a further aspect balancing of own CO₂ emissions on company and tool level as an introduction to the topic of sustainability is helpful. Lastly, deriving measures to increase the company's own sustainability and that of its customers, based on the main factors identified as influencing the sustainability balance sheet is necessary. ■

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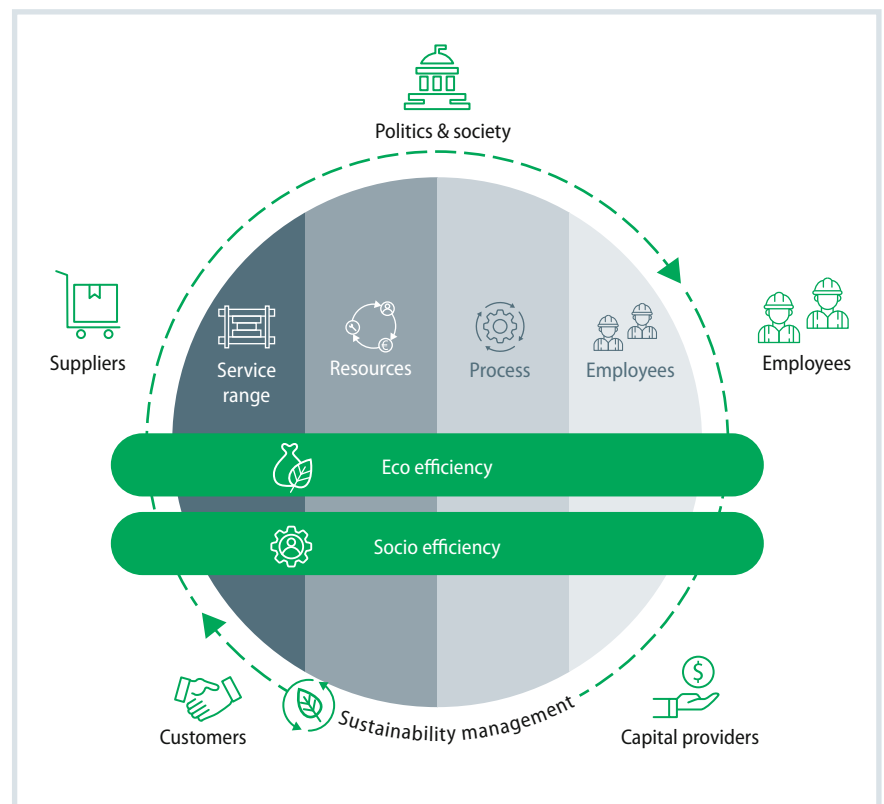


Fig. 2. Sustainable toolmaking also supports the sustainability agenda of the series producer with its measures Source: WBA; graphic: © Hanser