Inefficient use of resources
• Few optimized processes
• Time-consuming manual work

Efficient use of resources
• Optimized processes
• High degree of automation

Digital machining is set to transform the future of manufacturing, the biggest benefits being a significant increase in optimization of processes and better, more fact-based decision making.

Some data can be retrieved from machining in a conventional workshop, often through the experience of a single person. However, while skilled individuals are essential to the success of any company, isolating this vital information isolated makes a company vulnerable to competence loss. Making this data difficult to access also makes it difficult to share important information between different people and functions within the organization.

With cloud-based solutions, it is possible to collect and process data from machines, factories, and even individual tools within the company. The data can be analyzed by using advanced algorithms in order to gain learnings and optimize processes. With instant access to information and data, new collaboration opportunities are made possible between people in different parts of the organization and different parts of the world.

Advanced machining analytics

In-machining*

With sensor-based tooling solutions, data can be collected from the machining processes and used to optimize operations. This will improve overall efficiency and lead to higher metal removal efficiency, increased machine utilization, better component quality, and a more sustainable production process.

Low machine uptime due to unplanned stops and inefficient use of tools.

Only a fraction of all data is recorded and is seldom used for process improvements.

Capital is wasted on having an excessive number of tools and storage of goods.

Only 1/3 of the total energy consumption is used for the machining of the components.

Predictive maintenance, optimized machining process, no unplanned stops – meaning high machine utilization made possible by advanced analytics of data from connected machines.

A huge amount of data from the machining process can be recorded and analyzed in real-time or stored for process improvements.

Tool choice and application based on experience and skills.

Optimized tool choices, tool paths, and cutting data adapted to the actual machining conditions.

Streamlined logistic solutions with optimized inventory levels maximize capital efficiency.

Process optimization will lead to less energy consumption, and most of this energy is used for machining.

Advanced machining analytics

Conventional manufacturing

Design and planning

Manufacturing

Advanced

Machining

Machine utilization and process stability

Cost efficiency

Sustainable machining

Roadmaps and process improvements

Advanced machining analytics

In-machining

With sensor-based tooling solutions, data can be collected from the machining processes and used to optimize operations. This will improve overall efficiency and lead to higher metal removal efficiency, increased machine utilization, better component quality, and a more sustainable production process.

Digital machining not only reduces the time required for machining, it also helps to reduce costs and improve the overall efficiency of the manufacturing process. This is achieved through the use of advanced analytics, which enable manufacturers to make data-driven decisions and optimize their processes.

In this context, the use of predictive maintenance and machine learning algorithms can help manufacturers to anticipate and prevent potential issues, reducing downtime and increasing productivity. Moreover, the use of digital twin technology allows manufacturers to simulate various scenarios and optimize their processes before actually implementing them.

In conclusion, digital machining is a key component of Industry 4.0, enabling manufacturers to transform their processes and achieve sustainable growth in the future.