Intelligent visualization of coating systems

Successful IIoT solutions must allow several coating systems in a company to be easily linked. This also includes clear system visualization and intuitive user guidance.

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Industrial companies face the challenge of continuously improving productivity and quality while reducing costs. This requires precise production data and continuous production monitoring – if possible from anywhere and at any time. Clearly visualized key figures, productivity monitoring, online operating manuals and information on the exchange of spare parts are also required.

Exemplary studies show that industrial companies in Europe are under constant pressure to optimize, and this pressure will continue to increase in the future. Vereinigung der Bayerischen Wirtschaft e.V. (Association of Bavarian Economy): „Securing skilled workers will continue to be one of the major challenges for companies in Germany and Bavaria in the future. Our current study ‚Workplace Landscape 2025' shows that no easing of the situation is to be expected in the short and medium term. According to the study, there will be a shortage of up to 2.9 million workers in Germany in 2025, and a labor shortage of 350,000 people is predicted for Bavaria at that time.

Another study on car manufacturers by the management consultancy Hans-Andreas Fein states „Up to five times a year, suppliers are now being put under pressure. While car manufacturers demanded price concessions of 4.6 percent on average in 2017/18, the buyers of the supply giants demanded discounts of 5.3 percent."

Digital transformation

In the 1970s, information technology was introduced with desktop PCs, office IT and the first computer-based automation systems, which revolutionized the industry. For Industry 4.0, the central technology is not the individual computer (programmable logic controller, or PLC for short), but the connection via the Internet, for example with cloud services.

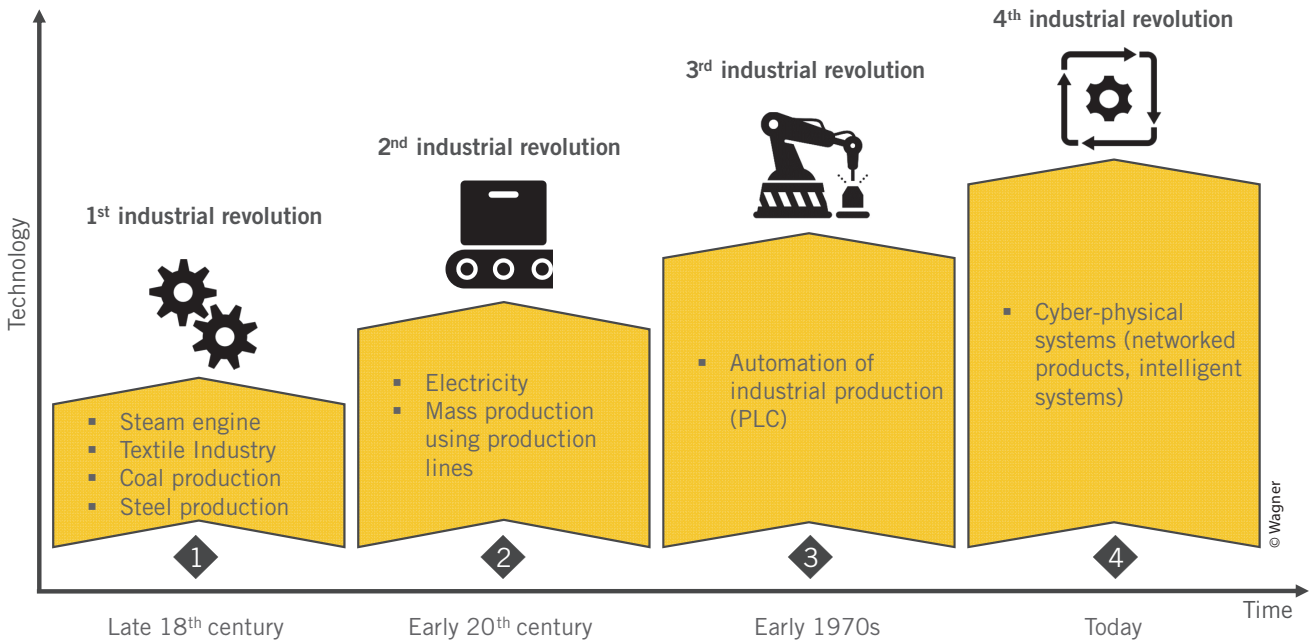

Figure 1 > Classification of the fourth industrial revolution

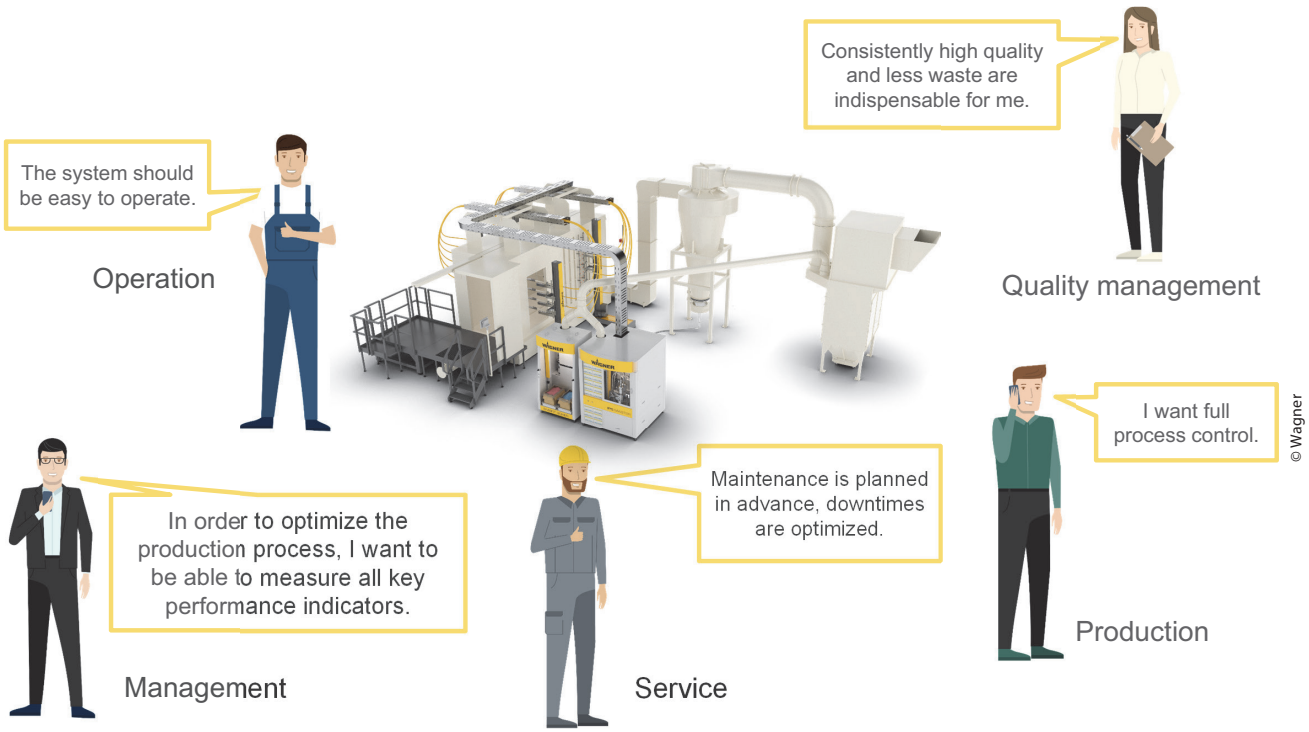

Figure 2 > Examples user needs

Networking across company or national borders gives the digitalization of production a new quality for companies: the „Industrial Internet of Things“ (IIoT), machine-to-machine communication and production facilities that are becoming increasingly intelligent have initiated the fourth industrial revolution (Fig. 1). Since the lack of skilled workers often means that unskilled workers have to be employed in industry, the new technologies are intended to support them in their daily work. Thanks to Industry 4.0, companies in Europe can ensure their competitiveness in the global market.

The basis for Industry 4.0 is formed by components and systems that can also be connected across company and national borders (IIoT capability). This combination, coupled with the highest level of automation and learning systems, is the key to successful Industry 4.0 applications.

Industry 4.0 in surface technology

A current challenge in surface technology lies in the complex composition of the different trades and automation levels of the individual companies. This often confronts coating companies with seemingly insurmountable technical and financial hurdles when implementing an Industry 4.0 solution. However, this can be solved by surface technology manufacturers by standardizing the system interfaces (in working groups VDMA, OPC UA).

Successful IIoT solutions must allow easy linking of several coating systems in a company. This includes a clear system visualization and notification system that is available to the user at any time and from anywhere.

Thus, future IoT solutions will have to meet important requirements: They must contribute significantly to the visualization and optimization of production today and in the future. Current plant control systems must be easy to operate to reduce complexity and increase the quality rate. In addition, the individual employees who are in contact with the coating line have individual needs that must be met (Fig. 2).

IIoT platform increases productivity

With the web-based information and management platform Coatify by Wagner, coating systems can be intelligently visualized. The entry page offers the operator an overview of all lines, their status and the most important productivity figures. It is the starting point for the individual dashboards: detailed, visually clearly structured and attractively presented reports for each integrated line (Figure 3).

Current characteristic values such as coating time, number of coated parts or conveying distance can be displayed and compared to historical values. The measured values of the last 365 days are used as reference values. The evaluation can be displayed over freely selectable periods of time as a graph, for example also per shift.

Everyone involved in the production process benefits from the platform‘s high level of transparency and ease of use – operator, production manager, quality manager and general manager.

Costs are continuously optimized and a high production quality is ensured. Thus, optimization potentials quickly become apparent and the success of the measures taken can be easily tracked. The awareness of system utilization, cost reduction and quality is increased. The platform also displays warnings and notes. If the Wagner service is required, the information can be forwarded directly. Using a remote function, Wagner employees can access the line controls directly and carry out remote maintenance if necessary.

The use of the platform is expected to increase productivity by up to five percent. This results from higher system availability, tight process control with notification function, short reaction times and anticipatory service measures such as the timely replacement of wear parts.

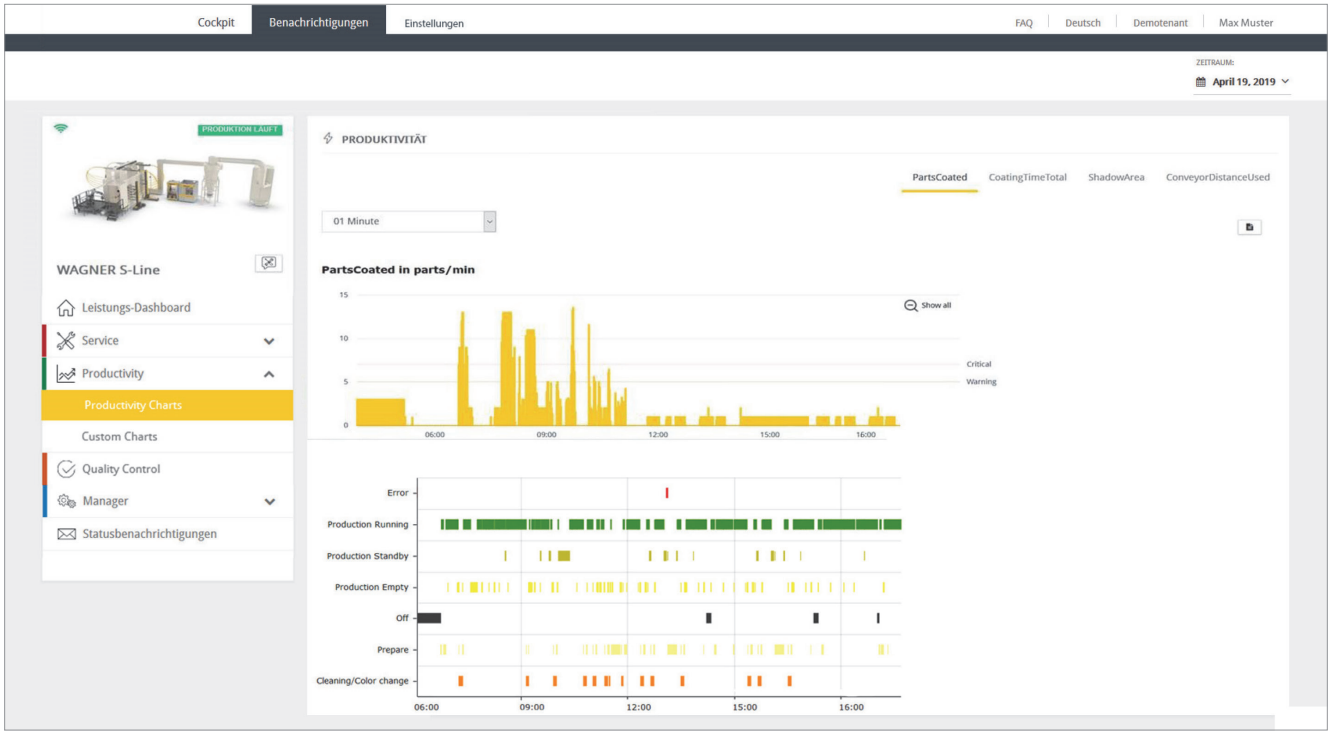

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Figure 3 > The IIoT platform delivers detailed, visually clearly structured and attractively presented reports, for example on productivity.

Component-specific visualization

Smart, advanced operating concepts significantly reduce complexity, protect the user from operating errors and increase system availability. Using the example of Wagner's C-Line wheel coating booth, significant simplifications for the operator can be achieved (Fig. 4). The operation allows easy visual input of the wheel geometry and visual gun positioning. No detailed expert knowledge is required to change the parameters. In addition, crash protection is ensured by the machine. Many industrial coaters have high expectations of IIoT solutions to achieve their productivity goals, which have been set high due to competitive pressure. Such solutions can already reduce unit costs and significantly increase the productivity of the coating process. In order to ensure consistently high production quality, they must also offer intuitive user guidance in combination with system operation. //

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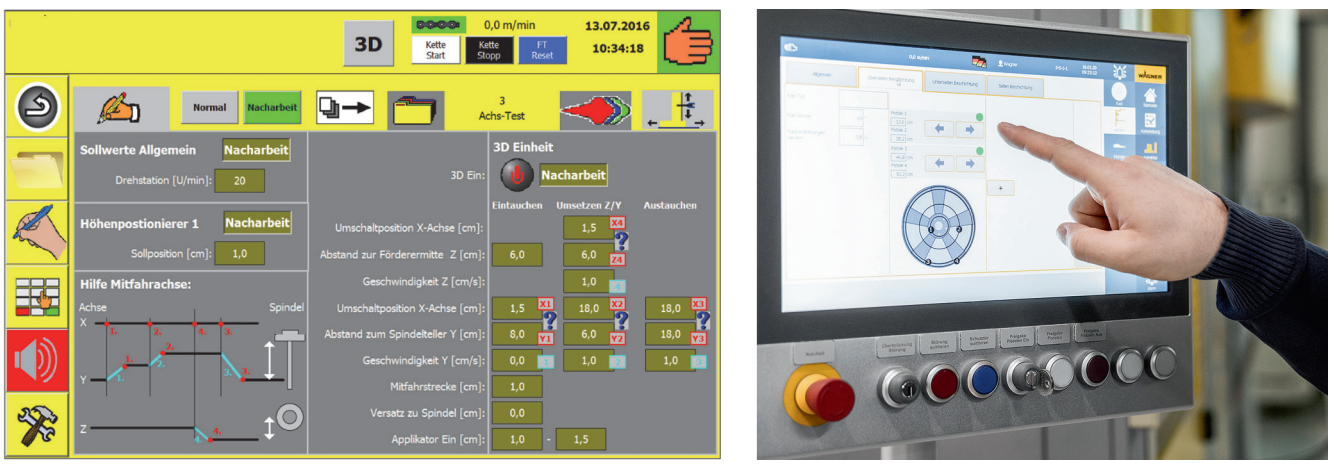

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Figure 4 > With the new operation (right), significant simplifications for the operator can be achieved compared to conventional operation (left).