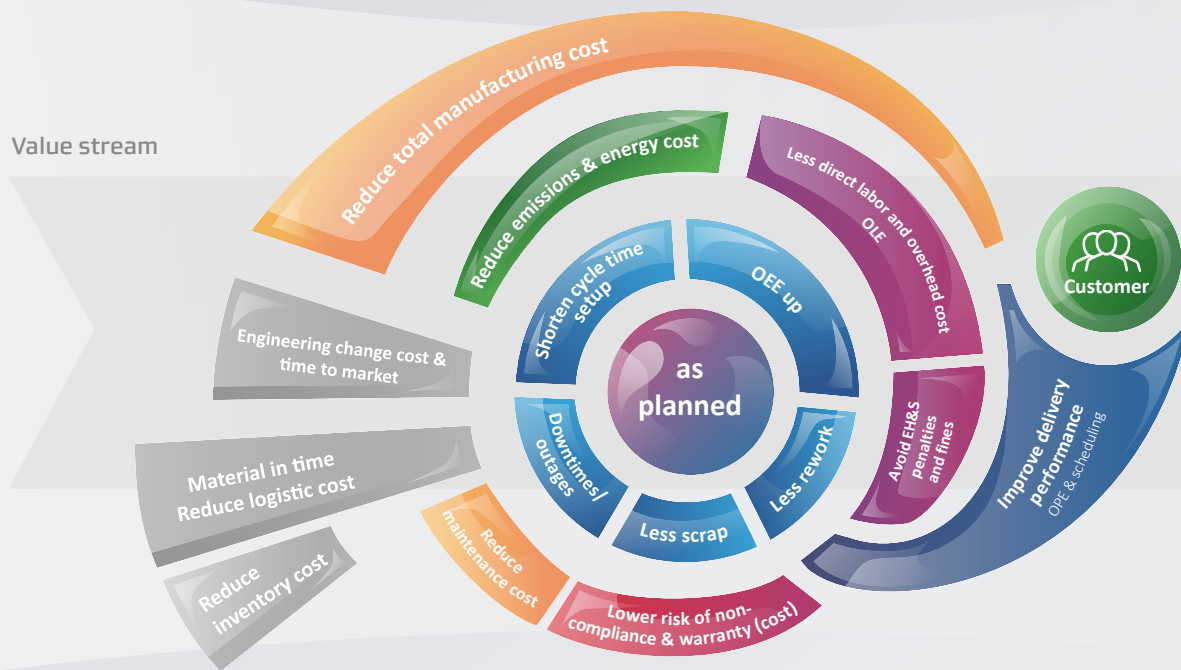Enisco | FORCAM
smart factory experts

Planning vs. Reality

How digitalized processes increase planning quality

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Value stream

Reduce total manufacturing cost

Reduce emissions & energy cost

Less direct labor and overhead cost
OLE

Shorten cycle time
setup

OEE up

Engineering change cost &
time to market

as
planned

Customer

Downtimes/
outages

Less rework

Avoid EH&S
penalties
and fines

Material in time
Reduce logistic cost

Reduce
maintenance cost

Less scrap

Improve delivery
performance
OPE & scheduling

Reduce
inventory cost

Lower risk of non-
compliance & warranty (cost)

"The art of making plans is to get ahead of the difficulties of their execution."
~ Luc de Clapiers.

Many occurances require production planning to react dynamically to actual circumstances and make the best possible use of the situation through planning alternatives. The influencing factors can be short-term change requests, fixed delivery dates, malfunctions in machines and systems, lack of availability of qualified employees, unexpectedly slow progress in production, and many others.

However, without information about the current production status due to a lack of digitized manufacturing processes, companies lack the necessary decision-making basis for short-term control and long-term optimization of their production. The increasing complexity of the equipment and systems to manufacture products requires minimizing the human factor. Digitizing production by connecting the machinery and systems offers a viable way to deal with the sheer volume of data, increase planning quality, react flexibly to unexpected events and meet delivery deadlines, and reduce the burden on employees.

Is the production running according to plan?

Operational production management aims to ensure that the production process runs as smoothly and economically as possible, given the available capacities and resources. Planning tools typically use production times as master data of the products manufactured from the ERP system to achieve this goal. However, these production times are rarely adjusted to actual monitored production times and can thus deviate significantly from accurate times. **These deviations distort planning, delivery times, unit costs, etc., and affect production planning.**

The following are some examples of disruptive factors that influence production planning

- Missing material at the machine
- Machine malfunctions
- Unexpectedly long setup times
- Short-term change requests from customers
- Employee absences

Therefore, many events can occur that require a timely response. Without an MES system, the necessary transparency is lacking to identify day-to-day problems within tight time limits, which can upset the existing production plan. These events must be recorded to have the necessary responsiveness

In a simple solution, sufficiently long buffer times are planned to keep the planning effort within tolerable limits, with the disadvantage that potentially considerable capacities are wasted in production. In contrast to this simple solution, digitized manufacturing processes allow real-time transparency.

This **real-time transparency provides the basis for decision-making** to

- *In the short term,* increase efficiency in the use of manufacturing capacity with acceptable planning effort and robustness of the production plan to unexpected events. A fast reaction enables a reduction of the deviation from planning.

- *In the medium term,* reliable master data allow a higher planning quality and the created data basis to activate the right levers in the continuous improvement process.

- *In the long term,* continuous monitoring of production creates the quantitative decision-making basis for raising output to a higher level of performance with the right decisions on investments, training, expansions, etc. Of central importance here is the granular recording of overall equipment effectiveness (OEE).

How does the digitization of manufacturing processes succeed?

To continuously record the actual situation in production, the machines must provide data about events in production. This data must be made available and put into context so that it can be used in dedicated use cases. Specific applications cover the necessary use cases to obtain relevant information from the data for controlling and optimizing production.

1. **Automated data collection:** The first task is to collect operating data and machine data with little effort during operation. The challenge is to connect heterogeneous machine parks with different machines, manufacturers, and machine controls, quickly and robustly without disrupting production.

2. **Contextualization of machine signals:** The collected raw data must be validated by an integrated set of rules. Depending on the configuration of the respective system, the data must be further contextualized (e.g., with order information). The results are current and historical information within a well-structured and easily accessible production model.

3. **Reporting and analytics:** Appropriate use cases are built on top of this production model, making the data useful for individual roles in the production. Real-time data visualizations, dashboards, and key performance indicators provide information about the production's current performance and help realize optimization potential. A critical use case at this level is detailed planning. The more granular and up-to-date the data basis, the more thorough planning can be.

The created, well-founded, validated, and easily accessible basis of figures, data, and facts supports various roles in production in their work. Employees and managers receive the necessary basis for decision-making. They are thus enabled to react to unexpected changes in the short term and operate the right levers in the long term to optimize production.

Conclusion

Machine and store floor data collection combined with MES functionalities gives companies real-time visibility into their manufacturing processes. Short-term and long-term optimizations support production planning, making it more reliable. The MES system provides the required transparency and basis for decision-making. Automated data collection improves master data in the ERP system, allowing reliable delivery dates to be determined. Active use of figures, data, and facts is required for the added value.

FORCAM has already been on the market for 20 years and offers manufacturing companies a quick start in digitizing their production.
Brownfield machines can be easily digitized, and the machine data obtained can be prepared for evaluation with MES functionalities. Open interfaces of FORCAM solutions allow information exchange between different systems.

Do you have detailed questions, or would you like to go into more detail on a specific topic? Then contact us for an expert appointment. (experte@forcam.com)