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Simulation in production controlling

Why simulation models are more than just a one-off planning tool.

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Production controlling

Many simulation models are created for a specific project. For example, in layout planning, automation, or new systems. After the decision is made, they are often no longer used. Simulation models can also help to better secure decisions in production controlling during ongoing operations.

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Define relevant key performance indicators (KPIs).

The simulation yields many results.

Therefore, it is important to define in advance which key performance indicators (KPIs) are truly relevant.

- **Typical examples:**
- **Throughput per shift**
- **Anlagenauslastung**
- **Work in progress (WIP)**
- **Punctuality**

This makes simulation results comparable and usable.

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Making fluctuations visible

Many reports only show average values.

However, other questions are often crucial for production:

- When and where do peak loads occur?
- Where are the queues forming?
- Which buffers are running dry?

Simulation makes such fluctuations visible.

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Practical example from production planning

A controller calculates a capacity utilization of 85% for a new product line. Everything looks stable in Excel.

However, the simulation paints a different picture: Fluctuations in process times cause traffic jams several times a week in front of the bottleneck.

Result: The buffer sizes were adjusted before the line went into operation.

Stability beats average.

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Compare scenarios in a structured way

Production planning constantly deals with uncertainties.

For example:

- **Changes in demand**
- **Malfunctions or machine failures**
- **new product variants**

Simulation enables structured "what happens if" analyses without interfering with real operations.

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Combining simulation with real production data

A current trend is the combination of simulation with real operational data, for example via:

- MES / ERP
- Production data
- digital models

This is how digital twins are created, which enable analyses based on real data.

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Using simulation for operational decisions

Simulation can support typical questions from the work:

- Adapting layer models
- Schedule maintenance windows
- Change material flows
- Check buffer sizes

This allows for an assessment of the impact in advance.

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Long-term use of simulation models

Many models are created as one-offs for a single project. When used long-term, they can provide support for:

- Variant analysis
- Continuous process improvement (CIP)
- Employee training using a model
- strategic capacity planning

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Production controlling

Simulation is frequently used as a planning tool.

When used correctly, it can also help to make more informed decisions and to control production systems more stably during ongoing operations.

Those who use models on a long-term basis gain an additional perspective on their production.

Feel free to contact us about this topic:
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