Digital Enterprise
Impact on Material Reduction

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WORLD MATERIALS FORUM

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Impact of digital levers on material consumption

	Digital levers	Actions
1 DEVELOPMENT	Digital validation in programs	▪ Fewer prototypes: virtual validation instead of physical tests
2 START OF PRODUCTION	Standardization & process simulation	▪ Optimization of process tuning and "plant learning curve" producing less scrap and lower launch costs
3 SCRAP AVOIDANCE	Predictive maintenance Reduction of variability	▪ Prevention of equipment breakdown creating scrap ▪ Better process control: prevention of process drifts ▪ Adjustment of process parameters to ensure 1st part is right
4 PROCESS CONTROL	Reduction of variability Process control	▪ Avoidance of frequent destructive tests thanks to process stability / capability ▪ Optimization of process parameters by mastering lower part of the tolerance
5 ECR / EOP	Data consistency in R&D and plants	▪ Better management of engineering changes leading to reduction of obsolete components at the introduction of the new product definition

Impact of digital levers on inventory

	Digital levers	Actions
1 INCOMING GOODS	Real time tracking of production Logistics network optimization	▪ Reduction of safety buffer, including incoming goods (end to end visibility for the supplier) ▪ Optimized in-transit material
2 WIP AND ASSET MANAGEMENT	Predictive maintenance Extended enterprise with open ecosystem Manufacturing Intelligence & digital management control	▪ Eliminate need for spare parts inventory: breakdown prediction will allow just needed intervention ▪ Vendors get real time access to consumables inventory for just in time replenishment ▪ Higher efficiency of capacity equipment leading to fewer machines
3 FINISHED GOODS	Production control & equipment flexibility 3D printing	▪ Reduction of changeover duration allowing smaller batches ▪ Reduction of inventory for EOP Spare parts, print on demand

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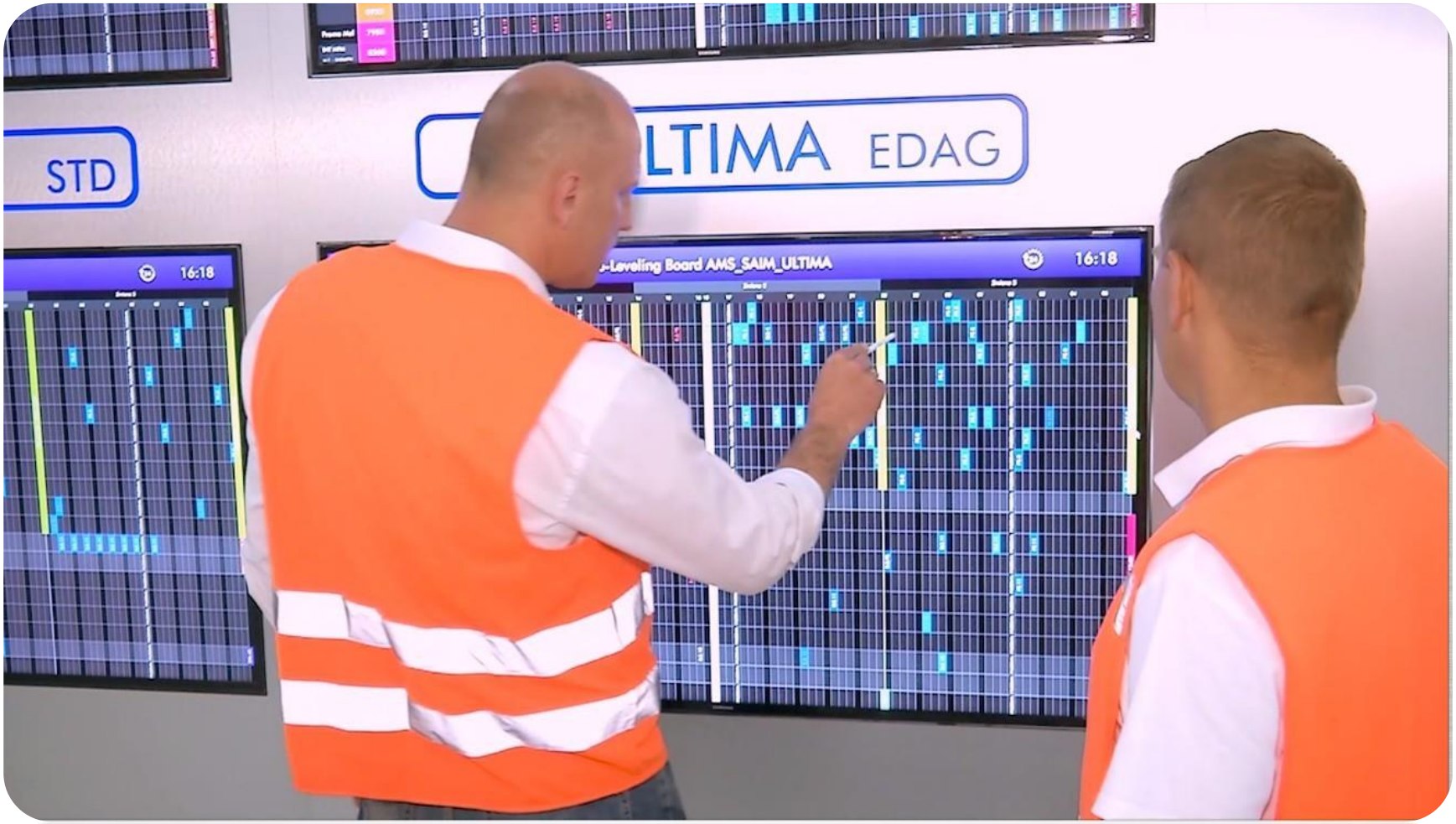
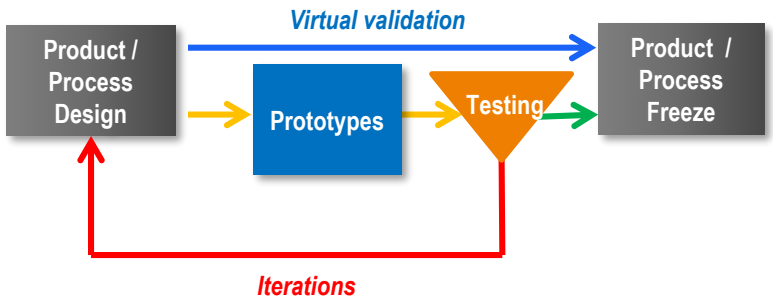


Digital validation in programs

Current Situation

- **600 programs** in development per year
- **40,000 prototypes per year**
- **About 2 million kg/year** of prototypes

Use cases



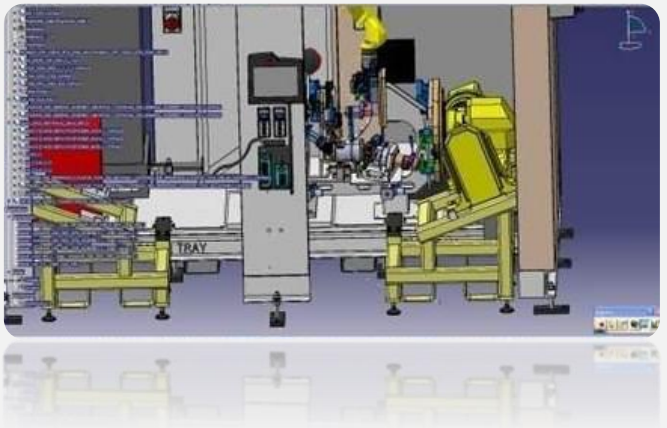
Impact on material consumption

- **20% of prototypes saved in development phases**
  - **400,000 kg/year** of prototypes saved
  - **€ 40 million** savings

Standardization and process simulation

Current Situation

- **200 programs** in launch phase/year
- **€ 50 millions** in start-up cost/year (material part)
- **1 million kg /year** of non-sellable parts



Use cases

- **Standardization ensures robustness of development / capable processes**
- **Process simulation defines detailed parameters (e.g. welding trajectories), avoiding process tuning at launch**
- **Simulation provides work instructions which shorten the learning curve**

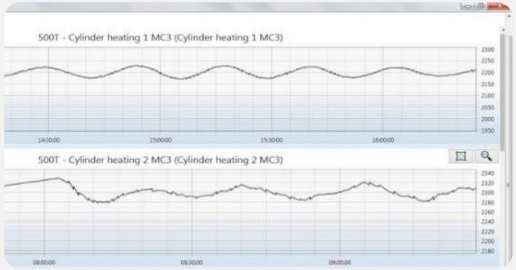
Impact on material consumption

- **25% "non-sellables" saved in launch phase**
  - **250,000 kg/year** saved
- **20 % savings in launch costs**
  - **€ 10 million** savings

Manufacturing intelligence & manufacturing execution (MES)
Impact on improvement of material consumption

Current Situation

- **180 million kg /year of plastics**
  injected on 775 machines



Use cases

- Real Time Process & context information
- Variability, scrap, & consumption under Control
- Use big data analytics to predict a better process parameter

PROCESS OPTIMIZATION

- MI manages parameters based on weight feedback for low range of specification
- MES uploads this parameter set in injection molding machine for optimization

Impact on material consumption

- **8% improvement in raw material consumption**
- **14 million kg of material saved/year**
- **€ 40 million savings in material improvement**

Predictive Maintenance

Current Situation

- **€ 120 million spare parts /year**
- **2 million kg of spare parts** in stock

Use cases

- **Prevention of equipment breakdown**
- **Eliminate spare parts inventory: breakdown prediction allows just needed intervention**
- **Vendors get real time access to consumables inventory for just in time replenishment**

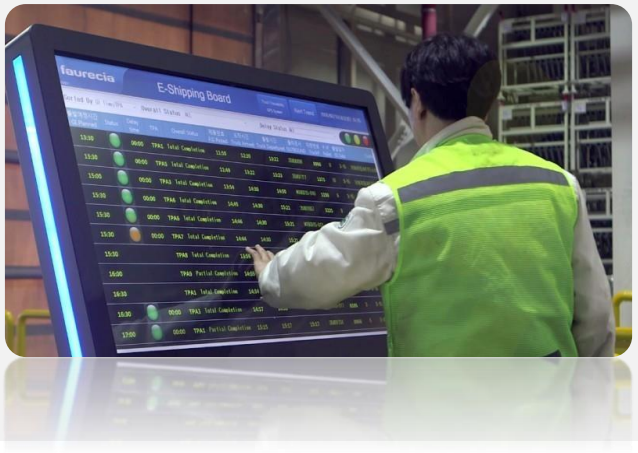
Impact on material consumption

- **20% of spare parts in stock**
  - **400,000 kg** of material saved
  - **€ 20 million saved**
- **5 % breakdown reduction**
- **€ 25 million of savings**

Real time tracking and logistic network optimization

Current Situation

- 10 days inventory
- € 700 million inventory
- 300 million kg inventory
- € 600 million of transport cost



Use cases

- Reduced buffer stocks
- Accelerated material flow
- Reduced container losses
- Reduced transit inventory
- Optimized consolidation hub

Impact on material consumption

- **15% inventory reduction**
  - **45 million kg** of inventory saved
  - **€ 100 million**
- **5 % transport cost saving**
  - **€ 30 million** savings
  - Decreased fuel consumption

Conclusion

Faurecia launched ambitious program to reduce material consumption

Enhancing use of digital validation and digital process simulation

Leveraging manufacturing intelligence and predictive maintenance

Developing real time tracking and optimizing logistic flows

64 million tons of material to be saved
€ 265 million cash improvement

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Technical perfection, automotive passion

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